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CORRODENTIA OF THE UNITED STATES OF AMERICA: I. SUBORDER ISOTECNOMERA

BY PAUL J. CHAPMAN

The most widely known member of the order Corrodentia is the minute, apterous indoor species known as the "book louse," *Liposcelis divinatorius* Müll. It appears strange that this and related forms should be considered more or less typical of the order, since an overwhelming majority of the known species are much larger, are fully winged, and are denizens of the outdoors. No generally accepted common name has grown up with the Corrodentia as in the other orders. Some of those suggested include "book-lice," "bark-lice," "wood-lice," and "psocids." The writer considers "psocids" the best name: it is short; it is already in rather common use for at least a portion of the order; its derivation from *Psocus* links it with the primary generic name-stem of the order (a precedent in point is that of the common name thrips for members of the order Thysanoptera); the terms "book-lice," etc., are misleading because none of them are descriptive of the order as a whole and furthermore the word lice in common names of insects is already overworked.

Burmeister's ordinal name of Corrodentia is used here, following Comstock¹ and others. Copeognatha² is used by Dr.

¹ Comstock, J. H. An Introduction to Entomology, 1925.

² Enderlein, G. Über die Morphologie, Gruppierung und Systematische Stellung der Corrodentien. Zool. Anzeiger 26: 423. 1903.

Gunther Enderlein, world authority on the order, while some prefer Psocoptera.

In this paper a study is presented of the American members of suborder Isotecnomera of Enderlein—those psocids possessing two-jointed tarsi in the adult stage. Every species of this suborder in America lives outdoors although at least two thrive indoors. Psocids have apparently made little appeal to collectors and students in the past if one may judge from the scanty collections in our museums and utter absence of a single comprehensive paper on the American fauna. These insects are small, soft bodied, and are both unattractive and difficult to study when pinned. Since psocids have been almost invariably pinned, in the past, this may explain in part the seeming lack of interest in the order. Psocids should be preserved in alcohol.

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Six weeks were spent at the Museum of Comparative Zoology at Harvard University in 1926 studying its valuable type collection. For the gift of types and other specimens, and the special privileges afforded, I am indebted to Nathan Banks and Samuel Henshaw of this institution. For similar reasons I wish to thank E. T. Cresson, Jr., of the Philadelphia Academy of Natural Sciences, T. H. Frison of the Illinois Natural History Survey, C. W. Johnson of the Boston Society of Natural History, and E. P. Felt formerly of the New York State Museum.

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GENITALIA AND TERMINAL ABDOMINAL SEGMENTS

Excellent taxonomic characters have been found in the genitalia and associated structures of most Corrodentia genera. So little consideration has been given to the homologies and appearances of these pieces by other workers that it is necessary to name and locate the several elements. The generalizations which follow will undoubtedly need revision as these studies proceed and especially when studies are made from a more strictly morphological viewpoint. For this reason the writer has avoided the use of special names for those structures which now appear to be of a secondary nature. The terminology used is principally from Comstock,¹ Crampton,³ Walker^{4, 5} and Chopard.⁶ I have also adopted some suggestions which were kindly made by Mr. R. E. Snodgrass.

FEMALE: In *Psocus*, *Peripsocus*, and certain other genera, a distinct if not long and strongly chitinized ovipositor is present. It is composed of three pairs of gonapophyses, one pair arising from the eighth segment and two pairs from the ninth. In *Cacilius* and others of its type these pieces are absent, reduced to one or two pairs of insignificant blades or otherwise modified from the hypothetical. The males show a greater variety of genitalic detail than do the females. In *Psocus*, *Lachesilla* and other genera, however, the structures in the females are usually clearly distinctive of the species.

³ Crampton, G. C. A phylogenetic study of the terminal abdominal structures and genitalia of male Apterygota, Ephimerida, Odonata, Plecoptera, Neuroptera, Orthoptera and their allies. Brooklyn Ent. Soc. Bul. 13: 49. 1918.

⁴ Walker, E. M. The terminal abdominal structures of orthopteroid insects: a phylogenetic study. Ent. Soc. Am. Ann. 12: 267. 1919.

⁵ Idem. Ent. Soc. Am. Ann. 15: 1. 1922.

⁶ Chopard, L. Recherches sur la conformation et la developement des dernier segments abdominaux chez les Orthopteres. Rennes-Imprimerie Oberthur (Insecta) 1920.

The terminal ventral plate (usually the 7th sternite) is called the *subgenital plate*. It frequently has a chitinous or pubescent pattern distinctive of the species. When a definite distal process occurs on the subgenital plate it is called the *egg-guide*. This piece cooperates with the inner gonapophyses in roofing over the passageway of the eggs. The *ventral gonapophyses* are borne on 8th segment, and are almost invariably long, slender and sharp-pointed blades which extend below the egg-guide and project tongue-like from the egg passage. Two pairs of gonapophyses arise from the ninth segment. The *lateral gonapophyses* are small lobe-like or cup-shaped pieces; in *Psocus* they support the dorsal gonapophyses at their base. The *dorsal gonapophyses* are large and trough-shaped—often fleshy—and supported by definite rami. For the sake of convenience, the plates, of various origins, which lie below the subgenital plate are called *interior genital plates*. Three lobe-like pieces guard the anal opening. All three are more or less triangular with the outer surface chitinized and with a group of setæ distally. The median or dorsal lobe is termed the *suranal plate* and the lateral pair are the *paraprocts*. Proximally on the paraprocts occurs a curious tubercle covered with hairs; this is called the *sense tubercle of paraprocts*.

MALE: The male genitalia are both symmetrical and asymmetrical. Considerable difficulty has been experienced in homologizing all of the structures in the suborder. Typically a large plate, similar to, but not homologous with, the subgenital plate of the female occurs in the male; the writer has adopted Crampton's name *hypandrium* for this piece. The *basal sclerite* is the term applied to the proximal division of the hypandrium in such forms as *Psocus confraternus*. In *Psocus* a true penis has not been found, the genital opening lying between a pair of *parameres*. These parameres are usually strongly chitinous and may consist of a pair of hooks (*P. confraternus*) or may be united, and present various specializations. According to Chopard⁶ there are typically two pairs of parameres. This condition apparently obtains in *Cacilius* and related genera.

The paraprocts and suranal plate are similar to those in the female. In *Psocus* however the paraprocts appear to have a

clasping function and the suranal plate in *Lachesilla*, *Ectopsocus*, and others may bear some specialization. Certain pieces with a clasping or other function arise from the primary structures discussed: special names for these have been avoided.

CLASSIFICATION

Enderlein⁷ has divided the Corrodentia into two suborders based principally on the number of tarsal and antennal segments. Psocids with two-jointed tarsi, in both the nymphal and adult stages, and with 13-jointed antennæ are included in the suborder Isotecnomera. It is with these that this paper treats. The members of the other suborder, Heterotecnomera, are characterized by having two-jointed tarsi in the nymphal stages and three-jointed in the adult stage; antennæ are 13 or more jointed.

Families of Isotecnomera may be separated as follows:

- Cu₁ fused to M for a variable distance; wings almost always well developed Psocidæ
- Cu unbranched, or Cu₁ not joined to M or if so by m-cu cross-vein; wings usually well developed but not always.....Cæciliidæ

The family Psocidæ, in America, is divided into two subfamilies, each represented by a single genus:

- Hairs on veins in basal third of wings; subcostal vein absent. No row of etenidia on inner surface of metathoracic tibiæ. A single pair of short gonapophyses present in ♀; paraproets in ♂ without distal claw*Pseudopsocus* n. gen.Pseudopsocinæ
- No hairs on wing veins, base of subcosta distinct; etenidia present on metathoracic tibiæ. Three pairs of gonapophyses in ♀; a stout prong distally on paraproet of ♂*Psocus*.....Psocidæ

The family Cæciliidæ, in America, may be divided into three subfamilies:

- 1—♀ *apterous* (♂ of American forms not known); segments of thorax of about equal size; head elongate, relatively narrow between eyes, clypeus flattened; buccal rods stout, bearing about 8 teeth.
.....*Bertkauia*.....Bertkauiinæ
- ♀ *subapterous* or *brachypterous*, but usually *macropterous*; prothorax greatly reduced; head broad, clypeus bulging; buccal rods slender, forked2

⁷ Enderlein, G. Zool. Anz. 35: 172. 1909.

- 2—Wings well developed or occasionally *brachypterous*; Cu unbranched; ovipositor present *Peripsocinæ*
 —Wings usually well developed but occasionally ♀ *subapterous* or *brachypterous*; Cu branched; no distinct ovipositor.....*Cæciliinæ*

KEY TO PERIPSOCINÆ

- Cross-vein r-m present in hind wing.....*Ectopsocus*
 —M fused to Cu for a variable distance in hind wing.....*Peripsocus*

KEY TO CÆCILINÆ

- 1—Female subapterous, a minute scale-like pair of mesothoracic wings; a single pair of stout arm-like gonapophyses in ♀.....*Terracæcilius* n. gen.
 —Wings reduced or not; when wings reduced gonapophyses greatly reduced 2
 2—Cross-vein m-cu and r present in fore wings.....*Graphopsocus*
 —These cross-veins absent..... 3
 3—Hairs on wing margin, veins and sometimes in cells..... 4
 —No hairs present.....*Lachesilla*
 4—Cell Cu₁ high, almost touching M; stout hairs on wing veins and also in cells at base of wings. Length of wings about 4.3 mm.
Teliapsocus n. gen.
 —Cell Cu₁ small, triangular; hairs on wings short, confined to pterostigma, veins and wing margin; length of wings about 3 mm. or less.
Cæcilius
 —Vein Cu₁ paralleling wing margin for considerable distance, causing cell Cu₁ to be large and flat; disposition of hairs as in *Cæcilius* except cells in apex of wing with hairs bordering wing margin.....*Polypsocus*

Family PSOCIDÆ

Subfamily PSOCINÆ

Psocus Latreille 1794

This genus is the largest of the order. Certain genera have been erected which would limit the earlier conceptions of *Psocus*. The characters used are chiefly in the shape of various cells of the wings and in the presence or absence of cross-veins. These characters in themselves are frequently indistinct—due to individual variation—and furthermore, lack of correlation with other characters would indicate that there is little foundation for considering them criteria for lines of descent. Unquestionably the species may be more or less grouped; this becomes especially plausible when the genitalic pattern is considered.

Both sexes of a number of American species are not known, and this, for one reason, makes it appear unwise at this time, to erect new genera for the inclusion of species with a *Psocus*-like wing venation based on the genitalia. The writer is forced therefore to consider the following tentatively as synonyms: *Cerastipsocus* Kolbe 1885, *Amphigerontia* Kolbe 1880, *Trichadenotecnum* Enderlein 1909, and *Loensia* Enderlein 1924.

KEY TO PSOCUS

- 1—Markings present or not on fore-wings, if present confined to proximal three-fifths (proximal to a line drawn from distal end of pterostigma to Cu_2) excepting small spots at end of veins and obscure clouding. Wings ranging from hyaline to deep fumose.....15
 - Definite spots or bands in distal two-fifths as well as in proximal portion of wings..... 2
- 2—Head narrow, vertex depressed and produced laterally into pedestals for reception of eyes..... 3
 - Interval between eyes nearly straight or convex, eyes not prominently elevated..... 4
- 3—A rather narrow band in proximal three-fifths of wing..... *elegans*
 - Markings covering most of proximal portion of wings..... *lichenatus*
- 4—Series of six small dark brown spots in cells R_1 to M_3 inclusive and proximal to a band at wing margin..... 5
 - No such series of spots..... 6
- 5—Lateral plates of subgenital plate equilateral triangular; distal prongs on hypandrium asymmetrical..... *quasitus* n. sp.
 - Subgenital plate rectangular; hypandrial prongs symmetrical. *slossonæ*
- 6—Wing markings consisting of numerous small spots, no distinct bands or large spots..... 7
 - Marked with bands or large spots..... 10
- 7—Spots small, rarely coalescing and not attaining wing margin in distal half..... *conspersus*
 - Spots profuse, coalescing in certain areas and more or less covering entire wing..... 8
- 8—Three triangular spots anteriorly on clypeus; a large symmetrical notched prong on hypandrium..... *desolatus* n. sp.
 - Clypeus with usual lines, pale posteriorly. Hypandrium with asymmetrical median ridge and arising to its left a secondary prong..... 9
- 9—Hypandrial prong two-thirds as long as ridge..... *moestus*
 - Prong very short, appearing merely as a notch at base of ridge. *maculosus*
- 10—Marking in distal two-fifths of wing a spot the size of cell M_3 and either confined there or extending into cell Cu_1 *oppositus*
 - Not so marked..... 11

- 11—A distinct cross on clypeus; wings 3.7 to 4.0 mm. long with a band along outer margin *pollitus*
 —Clypeus not so marked..... 12
- 12—Wings about 5 mm. or longer..... 13
 —Wings about 3 mm. or shorter..... 14
- 13—Wings with three bands in distal half radiating from cell Cu_1 .
trifasciatus
 —Head markings faded, three pairs of dark spots: on vertex, at ocelli and laterally on front..... *novaescotiae* in part
 —Usual pigmented areas on vertex tan mottled with fine reddish lines; clypeal lineation distinct, at least posteriorly..... *hoodi* n. sp.
- 14—Wings about 2.4 mm., mostly deep fumose with a transverse hyaline band midway *atratus*
 —Wing marked with a band along outer margin and one from base of pterostigma to anal veins..... *submarginatus*
 —Wing markings bordering veins in distal half, no distinct bands.
coquilletti
- 15—Head dull orange throughout, no distinct spots or lineation. Wings deep fumose, those of ♀ 6.4 mm. long, ♂ 4.7 mm. *venosus*
 —Wings if fumose not strongly so. Spots and lineation usually distinct on vertex and clypeus, respectively..... 16
- 16—Four large spots on clypeus; arms of epicranial suture joined to clypeus forming a small elliptical front..... 17
 —No such clypeal markings..... 18
- 17—Female *subapterous*, wings of ♂ about 4.5 mm. long, faintly fumose.
subapterous n. sp.
 —Wings of ♀ hyaline about 3 mm. long..... *cockerelli*
- 18—Wings about 5.3 mm. or longer..... 19
 —Wings about 4.5 mm. or shorter..... 23
- 19—A large blackish spot on clypeus touching posterior margin..... 20
 —Not so marked..... 21
- 20—A dark spot at furecation of $M + Cu$ (small in ♂); wing, outside of pterostigma, unmarked *leidyi*
 —Wings unmarked. R_1 conspicuously white in proximal half and black or brown in distal half..... *purus*
- 21—On head, pairs of spots: on vertex, at ocelli and on front.
 —Usual lineation on clypeus and dots on vertex indistinct.
novaescotiae in part
 —Dotted areas on vertex and lineation on clypeus distinct..... 22
- 22—Wings fumose, r-m cross-vein long. The median prong on hypandrium distinctly forked *infernicolus* n. sp.
 —Pterostigma long and shallow, r-m present or not. Median prong on hypandrium unforked *longipennis* ♂
 —Pterostigma sub-angulate; a broad band in proximal half of wing.
rosbyi n. sp.

- 23—A pair of spots on clypeus.....24
 —Clypeus not so adorned.....27
- 24—Spots posteriorly on clypeus. Wings unmarked, pterostigma non-angulate*variabilis*
 —Spots anteriorly on clypeus.....25
- 25— R_1 gently rounded. Typically the wing markings form the letter 'H'26
 —Pterostigma deep, R_1 sub-angulate. A band midway of wing and another proximal to it.....*longipennis* ♀
- 26—Distal prongs on hypandrium independent strongly chitinized.
subquietus n. sp.
 —Prongs joined by a yolk, median prong with strongly chitinized rib*quietus*
- 27—A distinct and often long r-m cross-vein present.....28
 —M rather broadly joined to R_s , at a point or even by a short r-m.....30
- 28—Bars at base of egg-guide straight; median prong on hypandrium flattened unbranched*petiolatus*
 —Bars at base of egg-guide curved; hypandrial prong strongly curved29
- 29—Eyes of ♂ only slightly larger than ♀. Median prong on hypandrium forked; at base of egg-guide a rectangular prolongation.
montivagus n. sp.
 —Eyes of ♂ very large. Hypandrial prong not forked; prolongation at base of egg-guide forked.....*confraternus*
- 30—Wings ranging from hyaline to fumose but unmarked (excluding pterostigma)31
 —Marked by definite bands or spots.....36
- 31—Pterostigma of moderate depth, R_1 evenly rounded32
 — R_1 angulate or subangulate.....33
- 32—Length of wings about 4.3 mm.; ♂ genitalia asymmetrical; subgenital plate E-shaped*lithinus* n. sp.
 —Wing length about 3.4 mm.; ♂ genitalia symmetrical; subgenital plate an inverted V supporting square lateral plates.....*inornatus*
- 33—Wings fumose34
 —Wings hyaline35
- 34—Wings about 4 mm. long, often strongly fumose and even a faint indication of banding.....*infumatus*
 —Length of wings about 3 mm., usually only faintly fumose.
insulanus n. sp.
- 35—Length of wings about 3.5 mm., ♂ genitalia of *confraternus* type.
persimilis
 —Wing length about 2.5 mm., ♂ genitalia not resembling *confraternus**campestris*
- 36—Epicranial suture arms touching clypeus.....*oregonus*
 —Condition not obtaining.....37

37—Marking in proximal half of wing triangular.....	38
—Markings not so extensive as to form a triangle.....	39
38—Spots at end of veins, wing length about 3.7 mm.	<i>floridanus</i>
—No spots at end of veins, wing length about 4.3 mm.	<i>striatus</i>
39—Egg-guide with lobes at base; a ridge on hypandrium gradually narrows and twists to left.....	<i>bisignatus</i>
—Egg-guide narrow at base; hypandrial structure large, complex—not a simple ridge	<i>texanus</i>

Psocus atratus Aaron

Psocus atratus Aaron. Am. Ent. Soc. Trans. **11**: 39. Pl. 9, Fig. 6. 1883.

Female:

Length of body 2.4 mm.

Length of fore-wings 2.4 mm.

Head and thorax above, uniformly shining deep brown gradually paling on the sides and below; abdomen paler, greyish brown, paling below. Maxillary palpus dark brown. Antenna slender, sparsely clothed with very long fuscous hairs. Eyes dull, purplish black.

Thorax: Legs dark brown. Wings (Pl. XX, Fig. 17) brown with a few paler or hyaline areas. Pterostigma very deep, R_1 bent abruptly to wing margin but the cell non-angulate. An incomplete hyaline band from basal third of pterostigma to wing margin at cell Cu_1 ; cells R_3 and R_5 , distal half of cell R_1 fumose while cells formed by media margined with fumose. A hyaline spot at wing margin in cells M_3 , Cu_1 and the distal part of cell 1A. Veins conspicuous, brown. Hind wing faintly fumose, darker along costal margin and in anal cell.

Abdomen: Terminal segments and genitalia (Pl. XIII, Fig. 5). Sub-genital plate and egg-guide form a very much thickened inverted letter "Y." A highly chitinized strip marks off the base of the egg-guide which is otherwise contiguous. Egg-guide blunt-pointed, apex pilose. Ventral gonapophyses short, just attaining end of egg-guide. Lateral gonapophyses large, elongate, cup-like, uniformly chitinized and with a row of hairs along distal margin. Dorsal gonapophyses with rather narrow rami, apex pointed; a large brown area bordering mesal margin and involving the apex. Paraprocts stout, the row of hairs

along latero-ventral margin long, closely set; sense tubercles brown. Suranal plate triangular, rather long and narrow; a triangular non-chitinized area proximally.

New York: Painted Post, Sept. 15, 1925, 1 ♀ on trunk of elm.

Pennsylvania: Near Philadelphia, 2 specimens (S. F. Aaron) P. A. N. S. In crevices of the bark of a black oak in woods. Holotype and Paratype.

Virginia: Falls Church July 14 to Sept. 29 a total of 12 specimens (Banks) M. C. Z.

Psocus bisignatus Banks

Psocus bisignatus Banks. Ent. Soc. Wash. Proc. 6: 203, Pl. 2, Fig. 10. 1904.

Female:

Length of body 3.0 mm. ave. of 8 individuals.

Length of fore wings 3.5 mm. ave. of 8 individuals.

Length of antennæ 2.8 mm. ave. of 8 individuals.

Head and thorax marked with deep golden brown, abdomen whitish striped with grey.

Head: Dotted areas on vertex distinct, brown; front margined with brown posteriorly and with a V-shaped mark medianly; clypeus lineated with rather broad parallel lines; posterior third of clypeolus and two-thirds of labrum brown; genæ touched with brown, no distinct spots. Eyes black, large. Antennæ and maxillary palpus brown.

Thorax: Rather completely marked with brown; tergal lobes shining rich brown. Legs beyond coxæ pale brown, tarsi darker. Wings (Pl. XX, Fig. 24) hyaline marked with rich brown. The pterostigma opaque, deep; R_1 subangulate; the distal two-thirds of cell brown. Just below inner angle of pterostigma a spot; a broad irregular band from base of pterostigma to end of cell 1A; most of cell 1A brown. Veins brown and in some individuals the veins in proximal three-fifths of wing margined with brown. Hind wing hyaline.

Abdomen: Terminal segments and genitalia brown. (Pl. XII, Fig. 15.) Proximally the subgenital plate consists of a pair of lateral somewhat triangular plates. At base of egg-guide a pair of small lateral lobe-like plates; the distal two-thirds rec-

tangular becoming slightly wider distally; apex truncate, non-chitinized, pilose; median part of egg-guide weakly chitinized. Ventral gonapophyses short, of usual shape. Lateral gonapophyses cup-like with a strongly chitinized pilose basal portion. Dorsal gonapophyses with sharp-pointed apex; mesally a small infuscated area. Paraprocts narrow, sense tubercles brown. Suranal plate roughly trapezoidal above, supported laterally by chitinized strips and at the distal three-fifths by a transverse bar.

Male:

Length of body 2.8 mm. ave. of 7 individuals.

Length of fore wings 3.3 mm. ave. of 7 individuals.

Length of antennæ 3.0 mm. ave. of 7 individuals.

Marked as female. Eyes phosphorescent, bluish green, very large. On abdomen below and almost touching genital processes a pair of brown spots.

Terminal segments and genitalia occupying a little more of abdomen than those of female, dark brown, asymmetrical. Hypandrium (Pl. XV, Fig. 6) jaw-like, giving rise medianly to a relatively broad, highly chitinized ridge which arches and narrows distally, and curves to the left, finally bending abruptly cephalad. Parameres (Pl. XV, Fig. 19) fused to form a triangle, apex truncate, bearing medianly inside a short prong which does not project beyond the apex. Paraprocts bear distally an upward pointing prong and near apex, a slight elevation bears a pair of stout spines. Suranal plate semicircular, with a conspicuous chitinized margin.

New York: Ithaca, Aug. 22, 1926, 8 ♀ 2 ♂ on dead hemlock and pine limbs, 1 ♀ 7 ♂ 6 nymphs 1925. Reared indoors by P. P. Babiý from limbs of deciduous trees, Aug. 6, 2 ♀ 1 ♂, Sept. 26, 1926, 1 ♀, Aug. 15, 1926, 2 ♂, July 11, 1926, 6 ♀ 1 ♂, Sept. 6, 1926, 1 ♀; Baiting Hollow, Suffolk Co., Sept. 19, 1926, 2 ♀; Sea Cliff, Sept. 5, 1925, 1 ♀ 6 ♂.

New Jersey: Englewood Cliff, Sept. 6, 1925, 2 ♀.

Tennessee: Mill Creek below falls on Mt. Leconte, Oct. 10, 1926, 1 ♀ (C. & B.).

Virginia: London Bridge, Aug. 25, 1929, 1 ♀. Falls Church, 25 June, 1 ♀ (Banks). Holotype. M. C. Z.

Psocus campestris Aaron

Psocus campestris Aaron. Acad. Nat. Sci. Phila. Proc. **38**: 14. 1886.

Known only from holotype, a male, in the Philadelphia Academy of Natural Sciences. It was collected by Aaron in "Southern Texas—from the live oak trees that compose the small groves (motts) on the prairies." The wings are about 2.5 mm. long and the pterostigma is of moderate depth, subangulate, and with a dark spot at the inner angle; R_1 is black before the angle and whitish beyond. While it was not possible to examine the terminal abdominal segments and genitalia critically they are not of the type represented by *confraternus* but more like *moestus*. The head markings are not unusual.

Psocus confraternus Banks

Psocus semistriatus Walsh. Acad. Nat. Sci. Phila. Proc. **14**: 361. 1862. *Partim* (1 ♂ of Paratypes).

Psocus confraternus Banks. Am. Ent. Soc. Trans. **32**: 2. 1905.

Psocus moderatus Banks. N. Y. Ent. Soc. Jour. **15**: 165. 1907.

Psocus additus Banks. Mus. Comp. Zool. Bul. **62**: 3. 1918 (♂).

Amphigerontia confraterna Enderlein in Dampf Sitz. Natur.-Gesell. Univ. Dorpat **31**: 35. 1924.

Female:

Length of body 4.0 mm. ave. of 11 individuals.

Length of fore wings 4.6 mm. ave. of 11 individuals.

Length of antennæ about 4 mm.

Profusely marked with dark brown, the abdomen grey suffused with purple.

Head: The dotted area on vertex distinct; a V-shaped mark midway on front; clypeus lineated with distinct nearly parallel lines fading out near the anterior margin; genæ unmarked except at margins; clypeolus and labrum brownish. Maxillary palpus fuscous, apical segment darkest, 3rd segment palest. Eyes phosphorescent, bluish-green.

Thorax: Rather completely marked with brown, margins of tergal lobes and sutures on sides whitish. Coxæ brown; femora, above, brownish; tarsi dark. Wings (Pl. XX, Fig. 10) pale

fumose, in some individuals nearly hyaline, marked with brown; pterostigmal area whitish, opaque. Pterostigma moderately deep, R_1 subangulate (slightly concave before inner angle beyond which it becomes slightly convex); a brownish area involves the distal half of the cell, extending below R_1 . An irregular brownish band from base of pterostigma to end of anal veins; towards base of wing, a series of three spots suggesting a band; an indistinct spot in cell R_5 behind R_s furcation. Veins brown paling basally; R_1 pale. *Cross vein r-m long, always present.* Hind wing unmarked; in some individuals $r-m$ present but usually very short or absent.

Abdomen greyish, suffused with purple, light at the sutures and pale below. Terminal abdominal segments and genitalia (Pl. XII, Fig. 9). Base of subgenital plate composed of a pair of broad, lateral plates, joined caudally by a transverse nearly straight slender strip from which arises medianly the elongate egg-guide. The strips and egg-guide form an inverted "T." Medianly on the strips a pair of short narrow "roots" proceed cephalo-laterad, in some individuals touching the lateral plates. Egg-guide made up of three chitinized areas: the proximal part swollen medianly and highly chitinized—a continuation of the transverse strips on the basal portion of subgenital plate; the distal portion evenly rounded, white; the intermediate section lightly chitinized, widest distally. Ventral gonapophyses relatively strong but of usual shape drawn out to a point apically. Lateral gonapophyses broad, strongly chitinized, consisting of two parts: a strong pilose basal portion and a non-pilose piece which fits sleeve-like around the base of the dorsal gonapophyses. The dorsal gonapophyses narrowing distally, giving rise to a sharp, drawn-out apex. Sense tubercles on paraprocts large, brown, set in a concolorous field. Proximal two-thirds of suranal plate chitinized, distal third evenly rounded, white.

Male:

Length of body 3.4 mm. ave. of 9 individuals.

Length of fore wings 4.4 mm. ave. of 9 individuals.

Length of antennæ about 4.0 mm.

Marked as in female. Wings inclined to be uniformly fumose, the markings indistinct. Eyes very large, slightly ovate, nearly twice as large as female.

The distal two-fifths or more of the abdomen capped by the highly chitinized terminal segments and genitalia: structure symmetrical (Pl. XIV, Fig. 6). Hypandrium proper triangular (viewed from below) bearing distally a characteristic group of three strongly bent hooks. Basal sclerite of hypandrium broad and relatively long. The median hook (Pl. XIV, Fig. 12) distally on hypandrium curves strongly cephalically, ending in a relatively much drawn out sharp point. It is constricted basally and is supported by slender chitinized strips which, from their lateral spread and abrupt ending, form a triangle with the vertex at base of the hook. On each side of this median hook arises a blunt hook which curves mesally and gradually dorsally. The three pieces, viewed from below, appear to be of equal size and shape. These lateral lobes are blunt-pointed and consist of two parts; the overlapping basal portion ends midway, but from below this condition is usually not visible. The parameres (Pl. XIV, Fig. 8) lying below the hypandrium are independent, caudo-laterally curved pieces. The slender proximal portion of the paraprocts widen to bear the brown sense tubercle; the apical portion is twisted bearing distally a blunt triangular hook. Suranal plate with a late arising perpendicularly which in profile bears lateral lobes.

New York: Whetstone Gulf, Lewis Co., Sept. 2, 1926, 1 ♂; Nigger Pond, Oswego Co., Sept. 3, 1926, 6 ♀ 7 ♂; Saratoga Springs, July 15, 1926, 13 ♀ 2 ♂ on dead pine and oak limbs; Ithaca, July 5, 1926, 2 ♀, July 11, 1926, 8 ♀ 2 ♂ on dead limbs, Aug. 22, 1926, 2 ♀ 3 ♂ on dead pine and hemlock limbs, Aug. 28, 1925, 1 ♂ (T. C. Barnes) on upper shoot of *Pinus strobus*, Sept. 26, 1926, 1 ♀; McLean Reservation, July 31, 1926, 7 ♀ on dead hemlock limbs; Hudson, July 15, 1926, 1 ♀; Ballston Lake, July 14, 1926, 9 ♀ on dead oak and pine limbs; West Barre, Sept. 19, 1925, 2 ♀ 1 ♂; Ceres, Sept. 16, 1925, 11 ♀ 1 ♂ beating dead limbs; Wellsville, Sept. 15, 1925, 14 ♀ 3 ♂ 4 nymphs, on dry roots of hemlock which had blown down; Rock City, Sept. 16, 1925, 35 ♀ 5 ♂ on dead limbs; Painted Post, Sept. 15, 1925, 1 ♀; Stow, Sept. 17, 1925, 5 ♀ on dead limbs; Little Valley, Sept. 17, 1925, 5 ♀ 1 ♂; Richburg, Sept. 16, 1925, 9 ♀ 2 ♂ on dead limbs; Penn Yan, Aug. 29, 1926, 1 ♀ 2 ♂; Sacandaga R., Fulton Co., June 27, 1910 1 ♀ Holotype of *P. additus* Banks, M. C. Z.

New Hampshire: Mt. Washington, 1 ♀ (Mrs. Slosson) Holotype M. C. Z.

Massachusetts: Worcester, Sept. 11, 1926, 1 ♀ (W. T. M. Forbes).

Maine: Mt. Katahdin, 1 ♂ Holotype *P. moderatus* Banks, M. C. Z.

Tennessee: Bristol, Oct. 5, 1926, 1 ♀ 2 ♂ taken at light of Coca-cola stand (C. & B.).

North Carolina: Base of Mt. Pisgah, Buncombe Co., Oct. 13, 1926, 1 ♂ (C. & B.).

Georgia: Tallulah Falls, Oct. 18, 1926, 1 ♀ (C. & B.).

California: Oakland, Apr. 17, 1915, 1 ♂ (E. P. VanDuzee) supplied by E. O. Essig; Berkeley, Sept., 1914, 1 ♀ supplied by N. Banks.

***Psocus cockerelli* Banks**

Psocus cockerelli Banks. Am. Ent. Soc. Trans. **30**: 100. 1904.

This species is represented by the holotype, a female, in the Museum of Comparative Zoology. It was collected by Prof. Cockerell Oct. 6, "on aster, at Whitewater by White Sand, New Mexico." The wings are hyaline and unmarked (outside of pterostigma); this cell is of moderate depth and rounded, a dark spot occurs at the inner "angle" resembling the condition in *quietus*. Wing length about 3.4 mm. Four spots occur on the clypeus, and the front is small and elliptical, since the arms of the epicranial suture are broadly joined to the clypeus.

It appears to be closely related to *P. subapterous* n. sp. and probably belongs to the "*quietus* group."

***Psocus conspersus* Banks**

Psocus conspersus Banks. Ent. Soc. Wash. Proc. **5**: 237. Pl. 4, Fig. 1. 1903.

This spotted winged species is rather distinct from others with similarly marked wings (*moestus*, *maculosus* and *desolatus* n. sp.) in that the spots are small and rarely coalesce. In the apical half of the wing small points are found at the end of the veins but the spots in the cells do not attain the edge of the wing. Banks gives the length for the species as 3 mm. I am not sure

but what some of the paratypes accompanying the holotype in the National Museum, Washington, D. C., represent another species; no specimens were available for a critical study of the genitalia. The specimens are recorded from Williams and Tucson, Arizona. A drawing of the fore-wing of the species accompanies the original description: R is indicated as joined to M at a point; the pterostigma is of moderate depth and rounded.

***Psocus coquilletti* Banks**

Psocus coquilletti Banks. Mus. Comp. Zool. Bul. **64**:305. Pl. 1, Fig. 7. 1920.

This small species ("Length 3 mm.") is represented by the holotype, a female, taken in Los Angeles, California, by Coquillett in 1889. The markings on the wings appear distinctive and are figured by Banks as indicated in the citation.

Holotype in Museum of Comparative Zoology.

***Psocus crosbyi* new species**

Female:

Length of body 4.0 mm.

Length of fore wings 5.3 mm.

The dotted areas on vertex distinct; a V on the front. Clypeus with lineation more distinct medianly. Clypeolus and labrum brown, and on genæ a brown spot. Apical segment of maxillary palpus brown. Antennæ brown, segments 2 and 3 pale. Eyes dull bluish black.

Tergal lobes rich brown. Pleuræ and coxæ mostly brown, tarsi brown. Wings hyaline or subhyaline (Pl. XX, Fig. 19). An incomplete brown band with distal border running from base of pterostigma to end of anal veins. Pterostigma deep, with R_1 subangulate; distal two-thirds brown, the pigmentation extending below the cell; a pale fumose spot in cell R_5 with faint touches along outer margin of wing. Veins distinct.

Abdomen dirty white coarsely and incompletely banded with grayish-brown. Terminal segments and genitalia (Pl. 12, Fig. 1). The proximal portion of subgenital plate narrow, widening laterally. The egg-guide broadly attached, blunt-pointed, chitinization forming an inverted "Y." Ventral gonapophyses of usual shape, sharp-pointed. Lateral gonapophyses cup-like, white, with some brown proximally, pilose; distal margin wide and pilose. Dorsal gonapophyses very large and fleshy although the piece is abruptly produced into a point distally. The dorso-mesal surface infuscated and likewise the mesal portion of the ventral surface of the paraprocts. Paraprocts of usual shape with sense tubercles brown, large. Suranal plate white above, gently rounded distally.

Washington: Longmire 22 Aug., 1927, 2 ♀ (Coll. Prof. C. R. Crosby). Holotype and Paratype.

***Psocus desolatus* new species**

Male:

Length of body 2.8 mm.

Length of fore wings 4.3 mm.

Similar to *moestus* in wing markings and general appearance but genitalia show relationship with *slossonæ* and *quaesitus* n. sp.

Head sulphur yellow above, indistinctly marked with pale brown dots; ocelli placed in a small black spot; genæ brown with a median whitish area. Covering the anterior three-fifths of the clypeus a conspicuous mark formed by the fusion medianly of the vertices of three brownish, roughly triangular areas; remainder of clypeus whitish except for the coarse lineation on the posterior two-fifths which does not, however, continue to the margin. Clypeolus and labrum light brown, maxillary palpus brown, except third segment pale. Eyes dull bluish black.

Thorax: Dull yellowish and pale brown above; sides brownish; legs pale, a brownish spot or two on outer surface of femora, tibiæ with brownish ring distally. Wings hyaline marked in a manner similar to *moestus* with numerous brownish spots. Veins pale brown, darker apically. M joined with Rs a short distance.

Abdomen: Sternites brownish gray; tergites pale yellowish, coarsely marked with brown at the sutures. Hypandrium (Pl. XV, Fig. 2) roughly diamond-shaped, symmetrical except for the pair of prongs on the distal margin. The left prong is nearly twice as long as the right one. An elongate median piece is attached a short distance above the ventral margin of hypandrium and extends to the dorsal margin; it is highly chitinized and distinctly notched apically; lateral margins of distal two-thirds parallel, basal portion swollen; apical half unattached, jutting out at a considerable angle from hypandrium; a pair of elliptical holes through hypandrium at the base of this piece. Arising from the lateral margin of hypandrium a pair of slenderly attached pieces which terminate in strongly chitinized mesally facing hollow claws. Parameres fused, consisting of slender arms forming an elongate heart-shaped structure; attachment proximally, below hypandrium at base of the median structure. Sense tubercles on paraprocts large, much elevated; the sharp claw which arises below and near the apex is bent dorsally past the termination of the piece. Paraproct broad, only strongly chitinized at sense areas and apex. Suranal plate with a curious triangular-shaped part arising perpendicularly as in *slossonæ* and *ornatus*.

Colorado: Pingree Park, Aug. 20, 1924, 1 ♂ Coll. Prof. C. R. Crosby. Holotype.

***Psocus elegans* Banks**

Psocus elegans Banks. Ent. Soc. Wash. Proc. 5: 203. 1904.

Female:

Length of body 3.0 mm.

Length of fore wings 3.0 mm.

Length of antennæ 2.8 mm.

Pale orange marked with several shades of brown. The shape of the head similar to *lichenatus*; the two species distinctly different from other American forms in this and other particulars. The head narrow except between the eyes where it is also strongly concave; laterally the vertex is drawn out forming pedestals for the reception of the eyes. Markings on head dull orange or sulphur above, a pair of dark brown bands above antennæ fused with markings on the clypeus which are dark brown laterally and anteriorly (a triangular posterior portion light brown); labrum dark brown; genæ unmarked except for a few dots just below the eyes. Antennæ pale, sparsely clothed with long hairs. Maxillary palpus pale. Eyes globular dull black.

Thorax: Tergal lobes brown, sides scantilly marked with brown. Legs pale, brown spot or band proximally on tibia; tarsi brown. Wings hyaline marked with two shades of brown spots. Pterostigma opaque with a definite dark brown spot covering distal one-third of the cell and also extending slightly below R_1 ; cell deep, R_1 rounded. Three large dark brown spots arranged to form an incomplete band, one at origin of Rs, the second at fork of vein RM and the third in distal three-fifths of cell 1A. An irregular dark brown spot covers about half of cells Cu_1 and M_3 . Cells M_1 and M_2 each have a small dark brown spot. A small light brown spot at end of veins R_{2+3} to Cu_2 inclusive. Veins pale. M fused with Rs a short distance. Hind wings unmarked.

Abdomen pale, coarsely marked with brown. Terminal segments and genitalia (Pl. XIII, Fig. 1). Subgenital plate triangular with strongly chitinized side pieces which are broad basally and drawn out to a point distally; apex truncate bearing a row of 5 or 6 hairs; what is probably the 7th sternite extends forward between the highly chitinized side pieces to a point almost half the length of the structure. Ventral gonapophyses

very long and slender. Lateral gonapophyses large, weakly chitinized, convex, oblong, bearing a row of hairs along the distal margin. Dorsal gonapophyses rather weakly chitinized, sharp-pointed apically. Paraprocts long and slender. Suranal plate triangular.

Virginia: Falls Church, Aug. 5, ♀ Holotype; July 12, 1 ♀ and July 17, 1 ♀, Paratypes; Aug. 8-10, 2 ♀ on bark of white-wood, chestnut and oak (all Banks) M. C. Z. Great Falls, 1 ♀ (Banks) M. C. Z.

New York: Ithaca, Aug. 22, 1926, 1 ♀ on cliff wall.

Psocus floridanus Banks

Psocus floridanus Banks. Am. Ent. Soc. Trans. 32: 2. 1905.

Female:

Length of body 3.0 mm. ave. of 6 individuals.

Length of fore wings 3.5 mm. ave. of 6 individuals.

Length of antennæ 3.1 mm. measurement of 1 specimen.

This species is closely related to *striatus* from which it may be distinguished by the smaller size and presence of spots at end of veins in fore wings. The basal three-fifths of wing as in *striatus*: in intensely colored specimens, the distal two-fifths of the wing fumose, the pigment attaining the margin at the end of veins (Pl. XX, Fig. 26). In most specimens all that is readily seen is a brown spot at the end of veins Cu_1 to R_{2+3} inclusive.

The subgenital plate (Pl. XII, Fig. 3) and basal portion of egg-guide nearly uniformly chitinized throughout; a distinct deep notch medianly on subgenital plate dividing the piece. Other structures similar to *striatus* except that the suranal plate bears a non-chitinized crescent proximally.

Male:

Length of body 3.2 mm.

Length of fore wings 3.9 mm.

Genitalia differing only slightly from *striatus*, as follows: the medium part of hypandrium (Pl. XV, Fig. 3) very slender and slightly grooved distally; the lateral plate on the left side not as broad basally; the strongly chitinized apical portion of the fused parameres occupies the distal half, and the plate at the base is inclined to be hexagonal; viewing the parameres (Pl. XV,

Fig. 22) from the rear, structure *in situ*, the right projection is stouter, with a slight depression on the inner surface and the left projection is twisted, flattened and fairly wide.

New York: Geneseo, Sept. 20, 1925, 1 ♀ on dead oak limb; Michigan Mills, Sept. 14, 1926, 1 ♂; Clarksburg, Sept. 18, 1925, 2 ♀ on tree trunks; Wellsville, Sept. 15, 1925, 2 ♀ on dead limbs.

Virginia: Caret, Oct. 28, 1926, 1 ♀ (C. & B.)

Florida: Biscayne Bay, 1 ♀ M. C. Z. Holotype.

***Psocus hoodi* new species**

Female:

Length of body 6 to 6.5 mm.

Length of fore wings 5 to 6 mm.

Length of antennæ about 10 mm.

Closely related to *Psocus novaescotiæ* Walker.

Head: On vertex an inverted U of white while an area above eyes and one involving the epieranial suture tan, and curiously mottled with a few thin reddish-brown lines. These margin the U-shaped white area and occur irregularly through the tan areas. Front with a triangular spot medianly and a pair of broad lines laterally from ocelli; other lines occur at clypeal margin, leaving a pair of conspicuous unmarked crescents on the front. Clypeus lined with relatively narrow brown parallel lines which fade in anterior third. Labrum touched with brown. Genæ infuscated, no distinct spot. Antennæ very long, slender and dark brown except segment three paler. Eyes dull bluish black.

Thorax: Anterior part of tergal lobes dark brown, posterior portion pale; pleuræ mostly unmarked. Coxæ brown, other leg segments much paler brown, tarsal segments darkest. Wings (Pl. XX, Fig. 15) hyaline, conspicuously marked with brown. Pterostigma milky white, rather deep— R_1 subangulate. A V-shaped brown mark starting at the middle of pterostigma, across to cell Cu_1 and thence along wing margin to vein R_{4+5} . A broad and rather irregular band from base of pterostigma, ending along anterior half of vein 2A. Veins coarse, brown, M reaching R_s at a point. Hind wing unmarked.

Abdomen: Broadly ringed with purplish grey. Terminal segments and genitalia (Pl. XII, Fig. 8). The subgenital plate composed of two parts: the basal portion which bears a chitinized inverted short "Y" (the interval between arms of the Y not acute) and the elongate egg-guide which arises behind the point where subgenital plate is infolded. The egg-guide is supported laterally by rami arising proximally and extending about half-way. The lateral gonapophyses cup-shaped, wide and short; outer surface brown, long hairs scattered over outer surface and at distal margin. Dorsal gonapophyses fleshy, trough-shaped, with an evenly rounded apex; an h-shaped (viewing right one) distal portion to internal rami. Ventral

gonapophyses very long and of usual shape—not visible with structures *in situ*. *Sense tubercle on paraproct white*; latero-ventral margin and dorso-distal portion of paraprocts pilose. Suranal plate triangular, composed of two parts, of which the distal element is triangular and infuscated.

Male:

Length of body 4.5 mm.

Length of fore wings 6.2 mm.

Resembles female closely, less robust; eyes only slightly larger; antennæ stouter, more pilose.

Terminal abdominal segments and genitalia (Pl. XV, Fig. 1) strongly chitinized, asymmetrical, and very similar to *novaescotiae*. The distal process arising from the jaw-like hypandrium consists of two parts separated by a transparent J-shaped portion. The left piece is concave, undulate and smooth-surfaced. A series of teeth appear behind a ridge marking the lateral margin of the left-part proper. The right hypandrial element consists of a median ridge which bears about six teeth and arises *from the extreme right* forming an ear-like lateral surface; the mesal portion concave and surface undulate. The median ridge branches distally and bears about four teeth along left branch. The parameres fused as in *novaescotiae*, notched apically, but slightly enlarged before apex. Paraprocts tipped with a strong dorsally pointed prong. Suranal plate consisting of two pieces; the distal margin truncate; the distal plate with chitinous arms laterally, extending into basal plate.

Arizona: Nogales, Aug. 30, 1927, 2 ♀ 1 ♂ on dead mesquite branches coll. J. D. Hood. Holotype (♂) Allotype, Paratype.

***Psocus infernicolus* new species**

Male:

Length of body 3.0 mm.

Length of fore wings 6.0 mm.

Closely related to *confraternus*, *montivagus* and *petiolatus* (also *P. bifasciatus* Latr. of Europe).

Dotted areas on vertex distinct. Ocellar interval black. A rectangular mark medianly on front; arms of epicranial suture not touching clypeus. Clypeus adorned with distinct brown parallel lines. Labrum brown, genæ unmarked. Eyes large, dull bluish black. (Antennæ missing.)

Thorax: A golden brown throughout, including coxæ—other leg segments a lighter brown. Wings faintly brown, inconspicuously marked with a band running from base of pterostigma to base of anal veins and an indication of another proximally. Pterostigma of moderate depth, rather evenly rounded at inner "angle" and with a brownish spot involving the central two-thirds of cell but not including apex. Veins golden brown throughout. A very long r-m cross-vein present in fore wings (and from its length in the holotype it is expected that this condition is a constant).

Abdomen slender, ringed with greyish brown and capped by the highly chitinized terminal segments. The terminal prongs on hypandrium similar to the *confraternus* group (Pl. XIV, Fig. 4). The median prong is widely forked distally (Pl. XIV, Fig. 14). When viewed from above, it resembles the condition of this piece in *bifasciatus* Latr. (Pl. XIV, Fig. 13); there is not, however, the dilation about midway found in *bifasciatus*. The lateral prongs show some differences as figured. The parameres resemble those figured for *confraternus*. Suranal plates with a weakly chitinized rectangular plate directed cephalad.

Wyoming: West Thumb, Yellowstone National Park. 28 Aug. 1927, 1 ♂, coll. C. R. Crosby. Holotype.

Psocus infumatus Banks

Psocus infumatus Banks. N. Y. Ent. Soc. Jour. 15: 165. 1907.
Female:

Length of body 3.3 mm. ave. of 7 individuals.

Length of fore wings 4.0 mm. ave. of 7 individuals.

Length of antennæ 3.9 mm. ave. of 6 individuals.

Related to *striatus* Walker from which it differs as follows: A pair of brown spots on the front and a pair on genæ. The wings (Pl. XX, Fig. 13) are almost entirely fumose; in fully colored specimens, strongly fumose. Hind wings pale fumose. The abdomen ringed with brown paling below.

The subgenital plate (Pl. XIII, Fig. 8) and egg-guide uniformly chitinized. The interval between the lateral plates triangular. Lateral gonopophyses large, the chitinized basal portion larger than in *striatus*. On the inner surface of the dorsal gonopophyses a large dark area. Suranal plate strongly chitinized basally giving rise distally to thin lateral strips.

Male:

Length of body 2.8 mm. ave. of 8 individuals.

Length of fore wings 4.1 mm. ave. of 8 individuals.

Length of antennæ 4.1 mm. ave. of 6 individuals.

Marked as in female. Wings often so strongly fumose that the band from base of pterostigma to end of anal veins is barely visible. A spot on each side of abdomen below, almost touches genitalia. The genitalia asymmetrical differing from *striatus* as follows: the median ridge of hypandrium (Pl. XV, Fig. 4) swollen basally especially on the left side and the piece turns

to the right distally; parameres (Pl. XV, Fig. 7) fused, triangular terminating in a pair of asymmetrical flat lobes from which arises midway a long sharp prong; the paraprocts bear distally a single large upward-pointing prong. Suranal plate large quadrate.

New York: Ithaca, July 11, 1926, 9 ♀ 2 ♂, Aug. 6, 1926, 2 ♀, Sept. 26, 1926, 1 ♀; Saratoga Springs, July 14, 1926, 3 ♀, 1 ♂ on dead limbs; Whetstone Gulf, Lewis Co., Sept. 2, 1926, 1 ♀ 2 ♂, on dead limbs; Painted Post, Sept. 15, 1925, 1 ♀ 1 ♂ on dead pine limbs; Geneseo, Sept. 20, 1925, 1 ♀.

Tennessee: Bristol, Oct. 5, 1926, 1 ♀ 4 ♂ (C. & B.). Taken at light of Coca-cola stand.

Virginia: Falls Church, 1 ♀ (Banks). M. C. Z. Holotype.

Psocus inornatus Aaron

Psocus inornatus Aaron. Am. Ent. Soc. Trans. **11**: 39. 1883.

Female:

Length of body 3.0 mm. ave. of 7 individuals.

Length of fore wings 3.4 mm. ave. of 7 individuals.

Length of antennæ 2.5 mm. ave. of 7 individuals.

Yellowish white marked with brown; the abdomen marked with grey mixed with brown.

Head: The lateral areas on vertex faint; involving the epi- cranial suture, however, a wide dark brown area proceeds anteriorly to enclose the ocelli and extends to the margin of the clypeus; clypeus lineated with close set golden brown lines; labrum dark brown; genæ unmarked. Eyes small dull bluish black.

Thorax: Tergal lobes shining brownish black. Legs pale, tarsi and distal half of tibiæ brown. Wings (Pl. XX, Fig. 25) faintly fumose throughout. The pterostigma opaque, with the distal half, or more, clouded with brown; R_1 evenly rounded, the cell of moderate depth. Veins brown. M usually joined to Rs at a point.

Abdomen marked with greyish brown, splotted above, arranged in stripes on the sides, pale below. Terminal segments and genitalia (Pl. XIII, Fig. 12). Base of subgenital plate consisting of a pair of nearly square lateral plates which are joined

distally by arms which form an inverted V. The distal portion of egg-guide rounded, distal margin pilose; the proximal portion consists of a highly chitinized central part and a pair of less highly chitinized lateral plates. Ventral gonapophyses of usual size and shape. Lateral gonapophyses large, sleeve-like, strongly chitinized at base and with a row of hairs below and at end of chitinization. Dorsal gonapophyses sharp-pointed, with a pair of small brownish areas, one touching the mesal and the other the lateral margins. Sense tubercles of paraprocts brown. Suranal plate triangular but blunt pointed, a non-chitinous crescent proximally.

Male:

Length of fore wings about 3.3 mm.

Marked as in female. Eyes small, only slightly larger than female. Antennæ stout. Terminal abdominal segments and genitalia symmetrical (Pl. XIV, Fig. 5), strongly chitinized, cap-like. The basal sclerite large, wide, fused narrowly to hypandrium proper. Distally is borne a pair of large, strong, inward directed lateral prongs and medianly a short truncate ridge with a short median tooth apically and arising at almost right angles to this tooth a large flat prong (not visible when viewed from below). The interval between the median piece and the lateral prongs angulate, nearly square. Parameres lying below hypandrium, independent, consisting of arms terminating in a swollen, talon-like part. Sense tubercles on paraprocts strongly elevated while from the mesal margin is produced the twisted flat upward-directed distal prong. Suranal plate roughly isosceles trapezoidal in shape, when viewed from above.

New York: Ithaca, Aug. 15, 1926, 5 ♀ on cliff wall, Aug. 22, 1926 1 ♀; Whetstone Gulf, Lewis Co., Sept. 2, 1926, 1 ♀; Riverhead, L. I., Oct. 1, 1926, 1 ♀.

Virginia: Spottswood, Oct. 4, 1926, 1 ♀ (C. & B.).

Ohio: Sandusky, July 22, 1926, 16 ♀, 10 nymphs, on trunk of elm tree in the city.

Illinois: Urbana, July 13, 1892, 20 ♀ (Hart), June 14, 1890, 2 ♂, July 1, 1888, 1 ♀, June 27, 1916, 1 ♀ (Hart) I. N. H. S.; Meredosia, Aug. 22, 1917, 11 ♀ on tree trunks. I. N. H. S.; Algonquin, June 18, 1890, 1 ♀, I. N. H. S.

Pennsylvania: Philadelphia 1 ♂ (S. F. Aaron). Holotype.
P. A. N. S.

***Psocus insulanus* new species**

Male:

Length of body 2.5 mm.

Length of fore wings 3.0 mm.

Golden brown markings throughout. An unmarked pair of lines on vertex due to a solid triangular brown area on epicranial suture and obscured dotted areas above eyes. Ocelli large, pigmentation blackish. A triangle of brown medianly on front. Clypeus indistinctly lined with a few broad brown lines with a darker line midway. Labrum brown, genæ unmarked. Antennæ pale brown. Eyes large dull bluish black.

Coxæ, most of plurae and tergal lobes concolorous—a light golden brown. Wings faintly fumose, unmarked. Pterostigma rather deep, subangulate, a greyish spot in inner angle. Veins pale golden brown throughout. In the holotype a short r-m cross-vein present.

Genitalia and terminal abdominal segments asymmetrical. The hypandrium jaw-like (Pl. XV, Fig. 23) and rather narrow. The distal portion triangular, consisting of a ridge, adorned with a series of teeth, one row containing about 8 teeth and a parallel one, three or four. To the right of this ridge the structure strongly chitinized, the left portion weakly chitinized. The parameres (Pl. XV, Fig. 8) asymmetrical and appear as figured, the distal pieces stout and strongly chitinized while the proximal portions are slender and weakly chitinized. The distal prong on paraprocts long and slender—but none the less stout—a conspicuous spine arises just above the point of origin of the distal prong. Suranal plate inclined to be five-sided, viewed from above, apex blunt.

New York: Wading River, L. I., 19 Sept., 1926. 1 ♂ Holotype.

***Psocus leidy* Aaron**

Psocus leidy Aaron. Acad. Nat. Sci. Phila. Proc. 38: 15, Pl. 1, Fig. 2. 1886.

Psocus bilobatus Banks. Mus. Comp. Zool. Bul. 62: 4, Pl. 1, Fig. 1, March, 1918 (♂).

Female:

Length of body 4.2–5.0 mm.

Length of fore wings 5.1–5.5 mm.

Length of antennæ 5.0–5.7 mm.

Ivory white, sparsely marked with dark brown or black and thinly covered with whitish hairs.

Head: dotted areas on vertex indistinct; a small irregular spot behind the eye and two larger irregular areas anterior of eye on front. Ocelli surrounded by a small black spot. A large, roughly circular, black area on the clypeus touching the posterior margin and extending to the center of the sclerite; clypeus further indistinctly marked by about 14 broad lines apparently radiating from the central half of the paler, anterior margin. Clypeolus white, labrum brownish black. Genæ unmarked except for a small dorsal black spot. Eyes of moderate size, deep black. Maxillary palpus dusky, paling at the joints, the apical segment much deeper colored. Antennæ slender, the first two segments yellowish white, the third brownish, and the remaining dark brown.

Thorax: A brownish or black spot above coxæ; on meso- and metathorax they are much larger, divided by the pleural suture. Another dark area is found subventrally on the mesothorax ahead of the coxæ. Tergal lobes shining black, sutures ivory. Legs ivory, each segment becoming progressively darker distally, the tarsal joints light brown. A distinct dark brown spot on the proximal end of the tibia and a similar smaller one inside, distally on the femur. Wings (Pl. XX, Fig. 12) hyaline, the most characteristic marking being a *large roughly circular, brownish or black spot centering on the point where vein M and Cu divide*—it is usually very small in the male. Pterostigma opaque, white; R_1 angulate; a brownish spot apically. The usual dark spot surrounding wing clasp and at end of cell 1A large. Hind wing unmarked. Veins dusky at base, brown distally, R_1 pale.

Abdomen: Coarsely and usually sparsely marked with dusky brown at the sutures, uniformly white below but occasionally striped. Subgenital plate (Pl. XIII, Fig. 4) roughly quadrate, large, strongly chitinized laterally; weakly chitinized median portion occupying about two-fifths of the piece. Egg-guide long and slender, gradually widening distally and ending in a non-chitinized pilose apex; this piece together with the socket-like structures on the margin of the subgenital plate form the inverted letter γ . Only the tip of the membranous portion of the egg-guide is visible, with the structures *in situ*, gonapophyses covering the wide crescent-shaped piece on each side. Ventral

gonapophyses long, very slender, each terminating in a sharp twisted prong embracing the apex of the egg-guide. Lateral gonapophyses large, uniformly weakly chitinized, white, decidedly cup-shaped, about as long as wide, the distal margin evenly rounded and beset with conspicuous hairs (a few hairs also on outer surface). Rami of dorsal gonapophyses relatively broad, gradually narrowing distally to end rather abruptly at the base of the weak but finely drawn out and pointed apex; mesally on the inner surface of this fleshy trough or scroll-like appendage (not visible with structure *in situ*) a large, irregular, fuscous area. The inner surface is also thickly set with minute spines. Sense tubercles on paraprocts black. Suranal plate white, triangular bluntly pointed and beset with hairs.

Male:

Length of body 3.7–4.2 mm.

Length of fore wings 5.0–6.0 mm.

Length of antennæ 6.0–7.0 mm.

Similar to female in markings, usually a little darker. Eyes very large and black. Antennæ stout, beset with stout hairs which are about three times longer than those on female. Wings as in female, except *the brownish or black spot where vein M₄ Cu fork much smaller*. In the darker specimens the wings are faintly fumose and R is dark.

Terminal abdominal segments and genitalia strongly chitinized, occupying distal half of abdomen. Viewed from the side the highly chitinized distal tergites broadly crescent shaped—the cephalic margin curved, the caudal one straight. Hypandrium (Pl. XV, Fig. 5) asymmetrical, the piece proceeds left of the center. On each side basally a pair of weakly chitinized lobes which are concave, disc-like; the left disc is nearly circular, the right one two times or more larger, ear-shaped. Laterally from the lobes arise three strongly chitinized crooked ridges, (the two on the right being close together) which fuse distally appearing to end in a blunt point, but the fused part arches sharply ventrally in a claw-like piece. On the right side of the median piece considerable of the weakly chitinized lateral part of hypandrium visible. The highly chitinized, broad, distal portion of the fused parameres projects above the apex of the

hypandrium. The basal part consists of a small plate from which arise the arms which soon fuse to give rise to the highly chitinized, broad, asymmetrical, crozier or hook-shaped distal part (Pl. XV, Fig. 16); the inner surface thickly beset with small tubercles. Paraprocts (Pl. XV, Fig. 15) clasper-like, exceedingly slender proximally, terminating in a mushroom-like part; tooth at lower margin broad basally; sense tubercle, and immediately adjoining field, black. Suranal plate somewhat quadrate, with a small blunt point distally.

New York: Hornell, Sept. 15, 1925, 8 ♀; Rock City, Sept. 16, 1925, 15 ♀, 2 ♂ solitary on trunks of maple and chestnut; Montour Falls, Sept. 21, 1924, 13 ♀, 1 nymph on trunks of trees; Painted Post, Sept. 15, 1925, 17 ♀, 5 ♂, on tree trunks; Stow, Sept. 17, 1925, 1 ♀ on trunk of ironwood; Sea Cliff, L. I., Sept. 6, 1925, 2 ♂ on dead oak branches; Ceres, Sept. 16, 1925, 3 ♀ on ironwood trunk; Hunter, Aug. 16, 1925, 1 ♂; Ithaca, Sept. 12, 1925, 6 ♀, 1 ♂, 1 nymph, on bark of ash, Oct. 2, 1925, 4 ♀, on sycamore, Oct. 10, 1924, 7 ♀ solitary on tree trunks, Sept. 12, 1926, 8 ♀, 5 ♂, 1 nymph, Sept. 6, 1926, 12 ♀, 19 ♂, (6 ♂ on dead poplar limbs, remainder associated with *P. purus* on bark of dead beech snag), Sept. 26, 1926, 9 ♀, 1 ♂, 2 nymphs, Sept. 3, 1894, 1 ♀, 1 ♂ (Banks) M. C. Z.; Clarksburg, Sept. 18, 1925, 1 ♀; Riverhead, Oct. 1, 1924, 1 ♀ on trunk of scrub oak; Geneseo, Sept. 20, 1925, 8 ♀, 1 ♂; Elmira, Oct. 1, 1925, 5 ♀ on ironwood; Richburg, Sept. 16, 1925, 2 ♀ on ironwood; Wellsville, Sept. 15, 1925, 3 ♀; Fairhaven, Sept. 7, 1924, 1 ♀ under loose stones associated with *P. purus*; Montour Falls, Oct. 7, 1924, 2 ♀ (C. R. C.); McLean Reservation, Grass Bog 3, Aug. 22, 1924, 1 ♂; Whetstone Gulf, Lewis Co., Sept. 2, 1926, 1 ♀; Michigan Mills, Lewis Co., Sept. 1, 1926, 10 ♀, 19 ♂, 3 nymphs on dead limbs; Parkers, Lewis Co., Sept. 2, 1926, 3 ♀, 1 ♂; Nigger Pond, Oswego Co., Sept. 3, 1926, 1 ♀, 4 ♂; Frecks, Aug. 19, 1926, 5 ♀, 2 ♂, 2 nymphs (S. C. Bishop); Haines Falls, Sept. 25, 1 ♀ (Banks) M. C. Z.; Moshulu, Oct. 4, 1 ♀ (Banks) M. C. Z.; Sea Cliff, L. I., Oct. 2 ♀, Aug. 1 ♀, July, 1 ♀ (Banks) M. C. Z.

Maine: Mt. Desert Island (Beech Mt.) Sept. 12, 1926, 3 ♂ (C. P. Alexander); Ft. Kent, Sept. 1910, 1 ♂ (C. W. Johnson) M. C. Z. Holotype of *Psocus bilobatus* Banks.

New Hampshire: Mt. Washington, 2 ♂ (Banks) M. C. Z.; Gorham, Aug. 3, 1868, 1 ♂, M. C. Z.; Franconia, 1 ♀ (Slosson) M. C. Z.

Massachusetts: Cambridge, Aug. 19, 1 ♂ (Banks) M. C. Z.

Rhode Island: 1 ♀, 1 ♂ (Dr. Leidy) P. A. N. S. Holotype and Allotype; 3 ♂, (Dr. Leidy) M. C. Z., 1 ♂ (O. Sacken) M. C. Z.

New Jersey: Riverton, Sept. 11, 1 ♂, M. C. Z.

Pennsylvania: Philadelphia, 2 ♀ (S. F. Aaron) P. A. N. S. part of type series; Pottstown, Aug. 8, 2 ♂ (Banks) M. C. Z.

West Virginia: Aurora, Aug., 2 ♀, 1 ♂ (Banks) M. C. Z.

District of Columbia: Washington, 1 ♀, 2 ♂ (Banks) M. C. Z.

Virginia: Falls Church, July 17, 1 ♂, July 27, 2 ♂, Aug. 2, 1 ♀, Sept. 1 ♀, 1 ♂, Oct. 20, 1 ♀ (Banks) M. C. Z.; Vienna, Oct. 2 ♀ (Banks) M. C. Z.

Wisconsin: Price County, Aug. 19, 1897, 1 ♀, M. C. Z.

Tennessee: Mill Creek, below falls, on Mt. Leconte, Oct. 10, 1926, 1 ♂, (C. & B.).

California: Blue Lake, July 27, 1927, 1 ♂ (J. D. Hood) beating mostly dead *Salix*.

In the vicinity of Ithaca during the last half of September and early October the females of this large, light colored species are commonly observed on the trunks of deciduous trees. At this time they occur singly; they have forsaken the gregarious habit common earlier. The females rarely fly but run rapidly a short distance, when disturbed, in that curious stumbling gait so characteristic of the order. The males fly readily. They disappear two weeks or more before the female. Collections made at weekly intervals at Ithaca, substantiate the belief that there is but one brood annually in this and localities northward.

Psocus lichenatus Walsh

Psocus lichenatus Walsh. Ent. Soc. Phila. Proc. 2: 183. 1863.

This species related to *elegans* and the two distinct from other members of *Psocus* because of the shape of the head. The wing markings extensive, somewhat resembling *moestus* or *Lichenomima sparsa* Hagen. I have seen paratypes in the Museum of Comparative Zoology and at the Philadelphia Academy of Natural Sciences. Walsh writes: "Occurred in the autumn, on

some precipitous sandstone cliffs, in great numbers." I have never taken any of this species and have no record of any collections being made of it other than those by Walsh about 1863 in the vicinity of Rock Island, Illinois.

***Psocus lithinus* new species**

Female:

Length of body 3.35 mm. ave. of 8 individuals.

Length of fore wings 4.4 mm. ave. of 8 individuals.

Length of antennæ 3.8 mm. ave. of 8 individuals.

Head: Dotted areas on vertex light brown; ocelli involved in a blackish spot; two short, parallel lines medianly on front; clypeus lineated with narrow pale brown parallel lines; a spot in center of genæ; posterior half of clypeolus and all of labrum brown. Segments 1-3 of maxillary palpus whitish, distal segment brown. Antennæ brown. Eyes of moderate size.

Thorax: Tergal lobes shining brown; white area in sutures broad; a brown spot or line above coxæ which are pale brown. Tarsi brown. Wings (Pl. XX, Fig. 11) faintly fumose, unmarked. The pterostigma opaque with indistinct light brown stippling in the distal two-thirds or less; the cell only moderately deep, R₁ rounded. Veins light brown. M joined to R_s at a point or for a short distance. Hind wing unmarked.

Abdomen striped with dark grey; the pigment confined to tergites. Terminal segment and genital processes (Pl. XIII, Fig. 3) dark brown. Basal portion of the subgenital plate E-shaped, due to the presence of a pair of short, elongate, lateral plates and a straight slender median plate. The egg-guide arrow-shaped except the apex broad and rounded; a white non-chitinized median core widens at and includes the pilose apex. Ventral gonapophyses stout, with a lateral arch distally, apex sharp-pointed. Lateral gonapophyses rather small, cup-shaped, the slightly swollen proximal portion sparsely pilose. Dorsal gonapophyses of average proportions with the apex drawn out, sharp, the chitinized support lateral, and in two sections; near mesal margin an elongate fuscous area. Sense tubercles on paraprocts rather large, brown. Suranal plate triangular, basal half chitinized; apex blunt-pointed.

Male:

Length of body 3.2 mm. ave. of 7 individuals.

Length of fore wings 4.2 mm. ave. of 7 individuals.

Length of antennæ 4.0 mm. ave. of 7 individuals.

Eyes black, only slightly larger than those of female. Antennæ moderately stout, strongly pilose. Terminal segments and genital processes (Pl. XIV, fig. 16) dark brown, highly chitinized, cap-like; at first glance appearing to be symmetrical but upon closer examination the lateral pieces distally on hypandrium found to be asymmetrical. Basal sclerite of hypandrium relatively narrow, definitely fused midway to the triangular hypandrium

proper. Distally and medianly hypandrium produced into a large, swollen, rather weakly chitinized, bluntly pointed, hollow cone which points slightly inward; on each side and extending below this cone, a pair of curious, highly chitinized arms. The right arm visible throughout its length, extending slightly beyond the median cone; the outer margin and truncate apex, serrate. The left arm swollen at base, then bends sharply to the right, extending below the median prong, ending where it touches the right arm. (While not visible with the structures *in situ* the distal third of the dorsal margin of this arm also serrate.) Parameres independent, consisting of a pair of rather stout arms terminating in fureated inward and laterally pointing hooks. The rather large sense area covers most of the basal portion of paraproct; apical portion twisted; from the lower distal margin a moderate sized inward and upward pointing claw. Suranal plate trapezoidal, gently rounded distally.

New York: Ithaca, collections in 1926: July 11, 3 ♀, Aug. 6, 20 ♀, 5 ♂, 8 nymphs, Aug. 15, 11 ♀, 5 ♂, Aug. 22, 10 ♀, 3 ♂, Aug. 30, 2 ♀, Sept. 6, 4 ♀, Sept. 12, 3 ♀, Sept. 26, 3 ♀, 2 ♂, taken chiefly in the shade on moderately dry rock cliffs in Six Mile Creek or its tributaries. Some however were found under loose stones. Holotype (♂), Allotype, Paratypes. Ithaca, Sept. 12, 1925, 7 ♀, 1 ♂ under stones; McLean Reservation, July 31, 1926, 2 ♀, 1 ♂, 5 nymphs, under loose stones in a pile; Saratoga Springs, July 14, 1926, 5 ♀, 3 ♂, 3 nymphs, under stones in a stone wall; Penn Yan, Aug. 29, 1926, 1 ♀ on rock cliff in shade; Whetstone Gulf, Lewis Co., Sept. 2, 1926, 4 ♀, on rock cliff; Clarksburg, Sept. 18, 1925, 1 ♀; Hunter, Aug. 16, 1925, 5 ♀, 2 nymphs, under large stones; Sea Cliff, L. I., Sept. 6, 1925, 1 ♀, 1 ♂; Geneseo, Sept. 20, 1925, 1 ♀; Woodwardia Swamp, Tompkins Co., Aug. 10, 1924, 2 ♀, under loose stones; Montour Falls, Sept. 21, 1924, 2 ♀ on rock cliff.

***Psocus longipennis* Banks**

Psocus longipennis Banks. Mus. Comp. Zool. Bul. **62**: 3. 1918.

Male:

Length of fore wings 5.7 mm. ave. of 6 individuals.

Length of body 2.9 mm. ave. of 5 individuals.

Head: The spots in the usual position on the vertex, brown. Ocelli set in a dark tubercle of usual appearance, but vertex abruptly sunken just behind lateral ocelli. Clypeus distinctly

lined with rich brown, *somewhat fused at posterior margin and again fused into a pair of lateral spots near anterior margin*. Labrum brown. Genae with a median spot. Maxillary palpus pale or light brown; antennae (missing except for 3 or 4 basal segments) not strongly pilose. Eyes dull bluish black, not exceptionally large.

Thorax: Mostly dark shining brown throughout, paling at sutures. Legs pale, darkening distally. Wings (Pl. XX, Fig. 6) typically faint fumose. Pterostigma very long, shallow, rounded distally; R_1 rather pale. Veins stout, light brown; R_s and M joined at a point or for a short distance.

Abdomen: Coarsely striped with purplish brown on sides; a series of diamond-shaped spots on median line of dorsum. Terminal abdominal segments and genitalia symmetrical, dark brown (Pl. XIV, Fig. 2) and of the type represented by *quietus*. Basal sclerite of moderate depth and typical of this group. Hypandrium proper roughly triangular, viewed from below, and strongly convex. Distally arise three well-spaced prongs; the median one is the longest, triangular, yet rather slender, and truncate distally; the lateral pair strongly chitinized, sharp pointed, directed slightly mesally. The parameres, independent, arising a short distance above proximal margin of inner surface of hypandrium. These pieces become swollen distally, fork, and each part strongly curved and pointed; the more proximal hook has a small, narrowly attached plate at its apex. Paraprocts elongate, with the large brown sense area midway; the distal hook twisted, triangular. Suranal plate triangular, definitely chitinized except at the nearly truncate apex.

Colorado: Boulder, 30 Aug. 1899, 1 ♂, M. C. Z. Holotype. Denver, (Oslar) 1 ♂. In Cornell University Collection. Used for critical study. Agrees in every particular with holotype.

Wyoming: Mammoth Hot Springs, Yellowstone Park, 30 Aug. 1927, 9 ♂, (C. R. Crosby).

In addition to the 9 males of this species taken by Prof. C. R. Crosby at Mammoth Hot Springs, 5 females of *Psocus* sp. were also collected which apparently are *longipennis*. The writer hesitates to describe these females unqualifiedly as *longipennis*

because of the small size of their wings (also shape of pterostigma) and differences in wing and abdominal markings. The only members of *Psocus* taken at Mammoth Hot Springs on Aug. 30, however, were these fourteen individuals. Head markings agree with the male; these are usually much more constant in the sexes than abdominal ones. Male genitalia of *longipennis* are very similar to *quietus* and *subapterous* n. sp. The females here discussed have genitalic structures practically identical with *oregonus* and *subapterous* n. sp. and similar to *quietus* and *subquietus* n. sp. These four species form a group remarkable for the small differences in genitalic structures of males and the even slighter differences in females. One might conclude, therefore, that females of *longipennis* would probably have genitalia of the *quietus* type.

Female: (*macropterous*)

Length of fore wings 3.6 mm. ave. of 4 individuals.

Length of body 3.2 mm. ave. of 4 individuals.

Agrees with male in markings, paler; abdomen splotched with purplish grey, faded above; eyes about one-third smaller. Wings subhyaline, with two wide fumose bands. *Pterostigma* of moderate length and depth, rounded; a fumose band including distal two-thirds of pterostigma, thence across to cell Cu_1 ; wing distal to this band, slightly fumose; a wide band proximal to junction of M and Rs. Veins coarse, light brown.

Female: (*brachypterous*)

Length of fore wings 2.5 mm.

Length of body 3.4 mm.

Differs from *macropterous* forms in being deeper colored throughout and of course by the reduced wings.

Wyoming: Mammoth Hot Springs, Yellowstone Park, 30 Aug. 1926, 5 ♀ (1 *brachypterous*). Allotype.

This case and that of *subapterous* are the only known examples of reduced wings in American *Psocus*.

***Psocus maculosus* (Banks)**

Myopsocus maculosus Banks. Am. Ent. Soc. Trans. **34**: 258. 1908.

Male:

Length of fore wings 3.8 mm.

This species closely related to *moestus*; the markings of body and wings (Pl. XX, Fig. 28) very similar. The genitalia, while showing a striking similarity to *moestus*, differs as follows: the left part of the median pieces on hypandrium (Pl. XV, Fig. 12) greatly reduced, appearing merely as an inconspicuous notch at the base of the right piece. The right piece broader except at the apex, longer and more crooked than the corresponding piece in *moestus*. The parameres (Pl. XV, Fig. 13) also similar to *P. moestus* but distally a former bipartite condition indicated by the slightly forked condition.

California: Berkeley, June, 1 ♂. Holotype M. C. Z.

A paratype (♂) was kindly supplied by Nathan Banks for critical study.

Psocus moestus Hagen

Psocus moestus Hagen. Syn. Neuropt. N. A. p. 11. 1861.

Female:

Length of body 2.5 mm.

Length of fore wings 3.3–3.6 mm.

Head: Dead sulfur yellow above, dotted area on vertex faint; ocelli surrounded by black; brownish ring around base of antenna. Clypeus lineated with about sixteen broken brownish lines radiating from a central point on the anterior margin (lines much more distinct anteriorly). Clypeolus light brown, labrum almost completely covered by a larger brownish spot. Eyes phosphorescent, bluish green. Second and apical segment of maxillary palpus fuscous, others whitish, but in other individuals all segments uniformly fuscous. Antennæ short, rather stout, clothed with relatively long hairs, pale brown.

Thorax: Pleuræ brownish. Mesoprescutum and several large spots on metaseutum light brown, remainder dull greenish yellow. Tibia rather pale except distally, remainder of leg segments brown. *Wings* (Pl. XX, Fig. 9) *largely covered with numerous small brown spots*. Some of the spots merge to form larger areas especially at base of pterostigma and where M and

Cu divide. Veins for most part pale, darker apically. M touches Rs at a point but no long cross-vein. Hind wing hyaline, unmarked except for a very few pale brownish spots distally in cell 1A and on costal margin near apex of wing.

Abdomen: Whitish above, almost uniformly dull brownish below; stripes on side at sutures, brown, widening ventrally. Base of subgenital plate consisting of a pair of large nearly square plates (Pl. XIII, Fig. 2). Egg-guide rectangular almost three times longer than wide, truncate, with apex non-chitinized, pilose; center of process less highly chitinized. Ventral gonapophyses of usual shape. Lateral gonapophyses cup-like, broad, short and rather large; proximal half strongly chitinized, and where chitinization ends a regular row of hairs; apical portion white, non-pilose. Dorsal gonapophyses broad at base, dorsal side drawn out into a very sharp point; rami extend well to apex. Sense tubercles on paraprocts large, only slightly raised, brown. Suranal plate pale brownish, triangular.

Male:

Length of body 2.5 mm.

Length of fore wings 3.3 mm.

Markings as in female; eyes larger. Antennæ stout with long hairs which are two or three times longer than those on female.

Abdomen not as deeply colored as female. Ventrally on each side, a circular fuscous spot back of the genital processes. Terminal segments and genitalia (Pl. XV, Fig. 18) asymmetrical. Hypandrium jaw-like, with a pair of strongly chitinized slender median pieces: the one on left, a stout, blunt pointed, unattached prong; the right one a slender ridge on each side of which are membranes which form a cap to enclose the parameres. Parameres fused, somewhat diamond-shaped, but more than twice as long as wide; the apex a single flat blade. Sense tubercles brown, only slightly elevated; paraprocts with the distal portion slender, curved upward and a strong, dorsally pointing prong arising from the ventro-apical surface. Suranal plate short, roughly quadrate.

New York: Ithaca, Sept. 26, 1926, 1 ♀, Sept. 5, 1926, 1 ♀, Oct. 7, 1926, 1 ♀ (Chester Rea), Aug. 6, 1926, 2 ♀; Stow, Sept. 17,

1925, 5 ♀ 1 ♂, on tree trunks; Clarksburg, Sept. 18, 1925, 1 ♀; Wellsville, Sept. 15, 1925, 3 ♀; Riverhead, Oct. 1, 1924, 6 ♀ 3 ♂ on bark of oak; Hornell, Sept. 15, 1925, 4 ♀; Hall, July 30, 1924, 1 ♀ indoors; Painted Post, Sept. 15, 1925, 11 ♀ 4 ♂; Parkers, Lewis Co., Sept. 2, 1926, 1 ♀; Michigan Mills, Lewis Co., Sept. 1, 1926, 5 ♀ 3 ♂; Saratoga Springs, July 14, 1926, 1 ♀ 2 ♂ on trunk and live branches of oak; Sea Cliff, L. I., Aug. 1 ♀ (Banks). M. C. Z.

Virginia: Caret, Oct. 28, 1926, 1 ♀ (C. & B.); Falls Church, July 17, 1 ♀, Sept. 24, and 29, 6 ♀ 3 ♂ (Banks) M. C. Z.

Maine: Beach Mt., Mt. Desert Is., Sept. 12, 1926, 1 ♂ (C. P. Alexander).

New Hampshire: High Island, July 1, 1 ♀ (Banks) M. C. Z.

Georgia: Dalton 1859, 1 ♀ (Sacken) M. C. Z. Holotype.

Psocus montivagus new species

Female:

Length of body 3.5 mm. ave. of 9 individuals.

Length of fore wings 4.35 mm. ave. of 9 individuals.

Length of antennæ about 3.8 mm.

Close to *confraternus* with which it agrees in markings of body and wings, size, and color of eyes. This species is somewhat lighter in coloring.

The subgenital plate and egg-guide (Pl. XII, Fig. 2) differ from *confraternus* as follows: the lateral plates are widely separated, inclined to be longer than wide; strips along distal margin slender, strongly curved; medianly, roughly rectangular prolongation cephalad from base of egg-guide (this usually serves to separate the females from *confraternus*). The egg-guide, while very similar, shows the termination of the highly chitinized basal portion slightly forked, and the egg-guide is not constricted at this point.

Male:

Length of body 3.4 mm. ave. of 12 individuals.

Length of fore wings 4.3 mm. ave. of 12 individuals.

Length of antennæ about 3.8 mm.

Eyes only slightly larger than the female, which character serves to separate the males of this species from *confraternus*.

The genital processes differ from *confraternus* as follows: The median prong arising distally on hypandrium curves strongly cephalically but is *forked apically* (Pl. XIV, Fig. 11) the mesal and dorso-lateral lines form right angles, the distal portion of parameres shell-like (Pl. XIV, Fig. 7) slender; the pair of prongs arising laterally from hypandrium inclined to be flattened, so that the overlapping of the short lateral piece is visible in positions where this would not show in *confraternus*.

New York: Whetstone Gulf, Lewis Co., Sept. 2, 1926, 8 ♀ 12 ♂ on dead hemlock and pine limbs, Holotype, Allotype, Paratypes; Michigan Mills, Lewis Co., Sept. 1, 1926, 12 ♂ on dead hemlock and spruce limbs; Parkers, Lewis Co., Sept. 2, 1926, 6 ♀ 14 ♂ on dead hemlock and spruce.

Psocus novæscotiæ Walker

Psocus novæscotiæ Walker. Cat. Neurop. Brit. Mus., p. 485. 1853.

Psocus contaminatus Hagen. Syn. Neurop. N. A., p. 10. 1861.

Psocus perplexus Walsh. Acad. Nat. Sci. Phila. Proc. **14**: 361. 1862 (♂).

Psocus cratægi Hagen (Mss. name of Asa Fitch). Verh. zool-bot. Ges. Wein **16**: 213. 1866.

Psocus hageni Banks. Ent. Soc. Wash. Proc. **6**: 202. 1904.

Female:

Length of body 5.0–5.5 mm.

Length of fore wings 5.5–6.5 mm.

Length of antennæ 6.7–7.5 mm.

Head: Dotted areas of vertex indistinct, obscured laterally by a pair of large fuscous spots; a pair of elongate fuscous spots touch lateral ocelli; the front bears a median V-shaped mark, and a pair of lateral spots; clypeus clouded with fuscous medially, incompletely lineated with about fourteen lines which fade anteriorly. Clypeolus and labrum unmarked. Palpus pale, last segment fuscous, becoming pitchy apically. Antennæ slender dark brown except segments 1, 2 and proximal half of 3, light brown.

Thorax: Tergal lobes shining black; on mesothorax in some individuals are distinguishable a series of four roughly circular blackish spots as in *purus*; pleuræ with a few touches of fuscous. Legs pale, tarsal joints brown; femora with a distal, inner, fuscous spot. Wings (Pl. XX, Fig. 5) hyaline, variously marked with fuscous or brown; markings range from an almost unmarked condition, exclusive of pterostigma, to individuals with a distinct broad band bordering the outer margin of the wing and other large spots. Pterostigma deep, R₁ angulate; pigment ranging from dark brown to light fawn. An elongate spot just

below inner angle of pterostigma. The following spots varying in size and intensity may be found: at fork of R and base of pterostigma, in cell R_5 behind furcation of Rs continuing over to cell M; in certain individuals a broad band borders the outer margin of wing ranging to those where all indications of a band are absent; at apex of cell 1A; in cell Cu at furcation of MCu and below in cell 1A—these two spots often join. Veins distinct, dark brown, pale proximally. Hind wings hyaline, unmarked.

Abdomen coarsely and irregularly marked above with fuscous, laterally marked at sutures, frequently fading out below. Terminal segments and genitalia (Pl. XII, Fig. 13). From the 7th sternite arises a small triangular piece which is notched distally whence it bends abruptly cephalicly and becomes attached to the triangular base of the egg-guide. Egg-guide elongate, white, beset with short hairs, evenly rounded at apex, supported medianly and laterally by chitinized prolongation from the base. The lateral pieces extend less than half the length of the structure while the median one, fully three-fourths the length. Viewed from the side the egg-guide becomes thickened apically. Ventral gonapophyses very long and slender terminating in a twisted sharp prong. Lateral gonapophyses broad, short, cup-shaped and covered with long hairs. Dorsal gonapophyses very large and very fleshy terminating in a short knob-like apex; visible rami strong and appearing to end midway on the lateral margin, but caustic potash specimens disclose an h-shaped (if looking at left gonapophyses) continuation which extends mesally and then distally, ending near the apex. Sense tubercles on paraprocts pure white, surrounded by black; apical part of paraprocts elongate, slender. Suranal plate white, triangular, supported laterally by chitinized pieces which end midway.

Male:

Length of body 3.5–4.0 mm.

Length of fore wings 5.5–6.0 mm.

Length of antennæ 6.5–7.0 mm.

Markings similar to female, usually much deeper colored, especially on head, above. Eyes large, black. Antennæ fairly stout, clothed with hairs which are 2 or 3 times longer than

on female and in greater number. Wings slightly fumose. Pterostigma showing the same variation in the amount and intensity of brown pigment as found in female. Spots on remainder of wing usually *paler and more often absent* (Pl. XX, Fig. 4).

Hypandrium (Pl. XV, Fig. 9) with the distal part consisting of two asymmetrical pieces joined distally by a slender arm, intermediate part transparent. Left piece broadly crescent-shaped with an evenly rounded convex surface which is thickly set with short tubercles. Right piece resembles a triangular prism in shape; the mesal surface undulated, leaf shaped, lateral and distal margin serrate each bearing from five to seven teeth. Basal margin of lateral surface also inclined to be serrate. Parameres asymmetrical, consisting of two slender wide-spread arms which fuse distally, the apical portion blade-like, gradually narrowing to the notched apex. Paraprocts clasper-like with long attachment arms, terminating in a foot-like part bearing the much elevated sense tubercles at the "heel"; a very long, dorsally pointing claw arises from the lower margin. Posterior margin of suranal plate produced laterally into curious bulb-like areas, similar to the sense tubercles on the paraprocts; the plate is quadrate.

New York: Ithaca, Sept. 12, 1925, 4 ♀ 3 ♂ 1 nymph, on trunk of poplar, Sept. 26, 1926, 3 ♂ 2 nymphs, on dead poplar and sycamore limbs, June, 1 ♀ (Banks) M. C. Z., July 29, 1897, 1 ♀ (Banks) M. C. Z.; Michigan Mills, Lewis Co., Sept. 1, 1926, 20 ♀ 7 ♂ on dead or shaded limbs of hemlock, spruce, and deciduous trees; Painted Post, Sept. 15, 1925, 1 ♀; Parkers, Lewis Co., Sept. 2, 1926, 1 ♂; Chapel Pond, Essex Co., July 19, 1925, 3 nymphs (S. C. Bishop); Long Pond, Suffolk Co., Sept. 19, 1926, 1 ♂; Artists Lake, Suffolk Co., Sept. 19, 1926, 3 ♀ 3 ♂ 2 nymphs on dead and dying limbs of larch; Lake Placid, Aug. 12, 1904, 1 ♂ (E. P. VanDuzee) M. C. Z.; Moshulu, Oct. 18, 1902, 1 ♀ (Banks) M. C. Z.; Sea Cliff, L. I., 2 ♀ 2 ♂ (Banks) M. C. Z.

Nova Scotia, Canada: Digby Co., Aug. 1917, 1 ♀ M. C. Z.

Maine: Southwest Harbor, Mt. Desert Island, Aug. 31, 1926, 1 ♀ 2 ♂ (C. P. Alexander); Beech Mt., Mt. Desert Island, Sept. 12, 1926, 2 ♀ (C. P. Alexander); Greene, Aug. 26, 1925, 1 ♂ (C.

R. C.); 1860, 1 ♀ (P. R. Uhler) M. C. Z.; West Beach, 1 ♀ M. C. Z.

New Hampshire: Franconia, 1 ♂ M. C. Z.

Massachusetts: Beverly, Sept. 9, 1869, 1 ♂ M. C. Z.; Boston, June, 1877, 1 ♀ (J. P. B. N.) M. C. Z.; Waltham, July 15, 1864, 1 ♀ (P. R. Uhler) M. C. Z.; Wellesley, Sept. 15, 1904, 1 ♀ (A. P. Morse) M. C. Z.

Rhode Island: Newport, Sept., 1 ♀ M. C. Z.

Maryland: Plummers Island, Sept. 28, 1903, 1 ♀ (Heidman) M. C. Z.; Sept. 9, 1 ♂ (Banks) M. C. Z.; 1 ♀ (P. R. Uhler) M. C. Z. Type of *P. contaminatus* Hagen and *P. hageni* Banks.

West Virginia: Aurora, Aug., 1 ♀ 1 ♂ (Banks) M. C. Z.

Virginia: Falls Church, June 28, 1 ♂, Aug. 27, 1 ♂, Sept. 16, 1 ♀, Oct. 13, 1 ♀ (Banks) M. C. Z.; Delphone, Sept. 10, 1 ♀ (Banks) M. C. Z.; Boykins, June 10, 1895, 1 ♀ (Banks) M. C. Z.

District of Columbia: Washington, 1854, 1 ♀ (O. Sacken) M. C. Z. Type of *P. contaminatus* Hagen and *P. hageni* Banks.

Illinois: Rock Island, 1860, 1 ♂ Paratype (?) *P. perplexus* Walsh, 1864, 1 ♂ (B. D. Walsh) M. C. Z.

North Carolina: Greensboro, June 1901, 1 ♀ (F. C. Fratt) M. C. Z.

Kentucky: Quicksand, June 25, 1925, 3 nymphs.

Georgia: Tallulah Falls, Oct. 18, 1926, 1 ♂ (C. & B.); Tiger, Oct. 18, 1926, 1 ♀ (C. & B.).

Florida: Monticello, Jan. 26, 1914, 1 ♂ M. C. Z.; Marion Co., 3 miles S. W. of Micanopy, May 9, 1926, 1 ♀ (T. H. Hubbell). Sweeping in low hammock.

The remarkable color variation found in *Psocus novaescotiae* Walker, particularly in the wings, has caused earlier workers to designate certain of the extremes as distinct species. A critical examination of the male and female genitalia of variously marked individuals shows clearly that they are one species. *Psocus contaminatus* Hagen, renamed *Psocus hageni* by Banks, is, as an examination of the types disclosed, the form having a broad band bordering the outer margin on the fore wing. The type of *Psocus perplexus* Walsh is non-existent, but specimens

sent Dr. Hagen apparently labelled *Psocus perplexus* in Walsh's hand writing are the form with nearly unmarked wings. All gradations in wing markings between these extremes occur. The species is widely distributed, and no color form appears to be confined to a given locality.

P. novaescotiae is found on tree trunks or on dead and dying limbs. It is not infrequently associated with *Psocus leidyi*.

Psocus oppositus Banks

Psocus oppositus Banks. N. Y. Ent. Soc. Jour. **15**: 165. 1907.

Psocus interruptus Banks. Mus. Comp. Zool. Bul. **64**: 306, Pl. 2, Fig. 15. Oct. 1920.

Female:

Length of body 3.2 mm. ave. of 6 individuals.

Length of fore wings 3.7 mm. ave. of 6 individuals.

Length of antennæ 3.6 mm. ave. of 3 individuals.

Head: Dotted areas on vertex light brown; a blackish nearly triangular spot involving ocelli, extending over front to clypeus; clypeus bears about six complete lines medianly, while laterally there are broken, short, horizontal lines; genæ unmarked; some clouding at base of maxillary palpus; posterior half of clypeolus and all of labrum brown. Eyes dull black. Antennæ brown, pale proximally.

Thorax: Tergal lobes shining dark brown, sutures whitish; sides mostly brown, legs pale brown. Wings (Pl. XX, Fig. 20) hyaline, marked with two shades of brown. Pterostigma deep, R_1 angulate or subangulate; a dark brown spot involves about the distal two-thirds and extends below R_1 . A characteristic dark brown spot involving all, or less, of cell *M* extending into cell Cu_1 , where it may barely encroach or cover nearly half of the cell; a light brown spot between this and the spot in pterostigma suggests a band. Another band but of light brown extends from base of R_s to end of cell $1A$; proximal to this band an irregular spot on vein MCu . Veins brown; cross-vein $r-m$ present or not. Cell *M* narrow. Hind wing hyaline touched faintly with brownish.

Abdomen: Dirty white, striped with brownish grey. Subgenital plate (Pl. XIII, Fig. 13) composed of a pair of small,

irregular, elongate, widely separated lateral plates which are connected medianly by a slender inverted V-shaped portion from the apex of which arises the rectangular egg-guide. Egg-guide consists of a rectangular distal portion with a chitinized "core" and a narrow non-chitinized border; proximally a pair of lobe-like plates. Ventral gonapophyses slender, fairly straight. Lateral gonapophyses with a swollen, pilose, proximal portion, while the distal part non-pilose and drawn out strongly laterally. The dorsal gonapophyses characterized by a definite mesal direction to the pointed apex; the rami in two narrowly connected sections, the lateral margin of the strongly chitinized proximal portion undulated—bearing three ridges. Sense tubercles of paraprocts large, light brown. Suranal plate strongly chitinized, triangular.

Male:

Length of body 2.6–2.7 mm.

Length of fore wings 3.2–3.5 mm.

Length of antennæ about 4.2 mm.

Marked as in female, possibly darker. Eyes a little larger. Antennæ very stout, strongly pilose.

Terminal abdominal segments and genitalia symmetrical (Pl. XIV, Fig. 20), dark brown, highly chitinized, cap-like. The lateral margin of the hypandrium proper, strongly chitinized and deeply notched midway; distal half of the piece more highly chitinized, swollen, terminating in a dorsally pointing prong. Embracing this median prong a pair of longer, slender, curved, lateral prongs. Viewed from the rear this group of prongs suggest the letter W. Parameres arm-like and arising near the base of the hypandrium; the distal third of each drawn out into a long slender prong. Paraprocts elongate, sense tubercles large, brown; arising from mesal margin distally a rather short triangular tooth. Suranal plate short, broad, gently rounded apically.

New York: West Barre, Sept. 19, 1925, 1 ♂ beating dry leaves; Artists Lake, Suffolk Co., Sept. 19, 1926, 2 ♀ 1 ♂ on dead larch limbs; Long Pond, Suffolk Co., Sept. 19, 1926, 1 ♀.

Virginia: Falls Church, Sept., 1 ♀ (Banks) M. C. Z. Holotype. London Bridge, Aug. 25, 1929, 2 ♀.

South Carolina: Sumter, Oct. 20, 1926, 2 ♀ (C. & B.).

Florida: Gainesville, Mar. 12, 1926, 1 ♀ (Hubbell); Lake Worth, 1 ♀, M. C. Z. Holotype *P. interruptus* Banks.

Psocus oregonus Banks

Psocus oregonus Banks. Am. Ent. Soc. Trans. **26**: 239. 1900.

Psocus californicus Banks. Am. Ent. Soc. Trans. **32**: 2. 1905.

Female:

Length of fore wings about 3.8 mm.

Pale orange marked with brown.

Head: Dotted areas on vertex distinct; *arms of the epicranial suture touch clypeus*. Clypeus lineated with brown parallel line; labrum brown; genæ clouded with brown. Eyes dull, black.

Thorax: Tergal lobes shining, brown; wings sub-hyaline, sparsely marked with brown. Pterostigma opaque; a brown spot covering distal two-thirds, the cell is of moderate depth, subangulate. An incomplete band from base of pterostigma to end of cell 1A (the pigment in this band is practically confined to a broad margin on each side of the veins in its course). Veins proximal to this band incompletely margined with brown, M joined to Rs by a short cross-vein or not.

Terminal abdominal segments and genitalia show relationship of species to the "*quietus*" group. Basal part of subgenital plate inverted V-shaped (Pl. XIII, Fig. 11), the egg-guide large, uniformly chitinized, arrow-shaped, its side convex, and the apex blunt pointed, weakly chitinized and pilose. Ventral gonapophyses with a sharp, twisted apex. Lateral gonapophyses produced mesally into a narrow portion; the structure short, wide, chitinized proximally and there pilose. Dorsal gonapophyses bears a chitinized, pointed apex and a fuscous yoke along distal margin below apex. Sense tubercles on the rather short paraprocts large. Suranal plate triangular with a narrow non-chitinized crescent proximally; apex swollen, non-chitinized.

Oregon: Divide, Sept. 12, 1 ♀. Cottage Grove, Sept., 1 ♀. Supplied by N. Banks for critical study.

California: Claremont, 1 ♀ (Baker). Holotype of *P. californicus* M. C. Z.

Psocus persimilis Banks

Psocus persimilis Banks. Am. Ent. Soc. Trans. **34**: 257. 1908.

Male:

Length of fore wing about 3.5 mm.

Dull white marked with brown. Head with the usual dotted areas on vertex; front brown mesally; clypeus lineated with moderately broad parallel lines; genae unmarked; posterior half of clypeolus and nearly all of labrum brown. Eyes dull black, very large.

Thorax: Tergal lobes shining brown. Wings hyaline. Pterostigma of moderate depth, R_1 rounded; an elongate brown spot in the cell and extending below R_1 , a brownish area at end of cell 1A. Veins stout, brown.

Terminal abdominal segments and genitalia (Pl. XIV, Fig. 17) symmetrical, strongly chitinized, cap-like. Hyandrium proper, when viewed from below, equilateral triangular in shape. Basal sclerite similar to other members of this group. The distal portion produced medianly into a swollen ridge. Lateral margins strongly chitinized, distal three-fifths twisted and lying in back of, and terminating before the apex, a short twisted piece. Distally the hyandrium then exhibits a blunt, weakly chitinized narrow termination of the median ridge, the lateral pieces evenly rounded, highly chitinized extending to a point in line with the apex of the median ridge. Paraprocts stout, bearing medianly the large sense area and terminally a flat, triangular, dorsally pointing hook. Suranal plate short, triangular, with blunt apex.

Texas: Brownsville, 3 ♂ Holotype and Paratypes. A paratype kindly supplied by Nathan Banks for critical study of genitalia.

Psocus petiolatus Banks

Psocus petiolatus Banks. Mus. Comp. Zool. Bul. **62**: 4. March, 1918.

Female:

Length of body 3.15 mm. ave. of 9 individuals.

Length of fore wings 4.2 mm. ave. of 9 individuals.

Length of antennæ about 3.8 mm.

Similar to *confraternus* in markings, lighter; on the abdomen the markings have a different distribution and are brownish or blackish. Eyes of moderate size, dull deep blue. Antennæ rather stout, brown, paling proximally.

Wings (Pl. XX, Fig. 27) hyaline or subhyaline, sparsely marked with several brown spots. Pterostigmal marking and shape of cell as in *confraternus* except R_1 evenly rounded with no indication of an angle. Faint indication of band from base of pterostigma to end of cell 1A. Veins dark, R_1 often dark, r-m shorter than in *confraternus*.

Abdomen with a large brownish black dorsal saddle which narrows and ends midway on the sides; a large triangular purplish brown area on sternum at subgenital plate extending cephalically to middle of abdomen. Genital processes similar to *confraternus*, the subgenital plate and egg guide (Pl. XII, Fig. 6) differ as follows: the shape of the lateral plates; the characteristic straightness of the strongly chitinized distal strip; and the shape of the egg guide.

Male:

Length of body 2.9 mm. ave. of 14 individuals.

Length of fore wings 3.7 mm. ave. of 14 individuals.

Length of antennæ about 3.7 mm.

Similar to female in markings, darker. Antennæ stout, dark. Eyes only slightly larger than female. On the wings, vein R_1 usually quite dark.

The genital structures similar to *confraternus* and *montivagus* differing in that the three distal lobes on hypandrium are much flattened (Pl. XIV, Fig. 18). The median structure is short, curving only slightly cephalically (Pl. XIV, Fig. 10); viewed from below the sharp-pointed apex readily visible; the median prong and its basal portion are so completely one that a triangle is formed, with the vertex the termination of the piece; the lateral margins are nearly straight, with only a slight constriction midway. The lateral lobes flat, showing clearly from below their two-pieced condition (the thin dorsally curved inner piece, supported laterally by a strong overlapping piece which ends halfway). The parameres (Pl. XIV, Fig. 9) as in *confraternus* but the distal parts only slightly concave.

New York: Whetstone Gulf, Lewis Co., Sept. 2, 1926, 1 ♀ 6 ♂ on dead hemlock; Hudson, July 15, 1926, 1 ♀; Ballston Lake, July 14, 1926, 1 ♂, taken in beating dead oak and pine limbs; Geneseo, Sept. 20, 1925, 2 ♀ on dead oak limbs; Sea Cliff, Sept. 6, 1925, 1 ♂; Parkers, Lewis Co., Sept. 2, 1926, 1 ♂.

Indiana: Tremont, July 24, 1926, 1 ♂ (Sand Dunes).

Tennessee: Bristol, Oct. 5, 1925, 4 ♀ 6 ♂ (C. & B.) taken at light of Coca-cola stand.

Virginia: Falls Church, 30 June, 1 ♀ (Banks) M. C. Z. Holotype.

Psocus pollutus Walsh

Psocus pollutus Walsh. Acad. Nat. Sci. Phila. Proc. **14**: 361. 1862.

Female:

Length of body 2.9–3.2 mm.

Length of fore wings 3.7–4.1 mm.

Length of antennæ 3.4–3.8 mm.

Head: Whitish with the usual dotted areas on vertex, brown; a pair of spots touching lateral ocelli; a V-shaped mark medianly on front and a pair of lateral spots; genæ white, margined with brown and with a median brown spot; clypeus broadly lineated with brown—the distinctness of the lines varying considerably—and bearing a distinct cross which divides the clypeus into four almost equal areas. (This cross is distinct even in nymphs and teneral adults.) Posterior half of clypeolus brown. Maxillary palpus brown; segments becoming progressively darker. Eyes phosphorescent bluish green. Antennæ rather stout, light brown, segments 1–3 pale.

Thorax: Whitish areas above coxæ, pleuræ incompletely marked with brown. Tergal lobes brown, margined and bisected with white or pale brown. Legs pale, femora bearing a dark spot distally below, tarsi brown. Wings (Pl. XX, Fig. 18) hyaline, marked conspicuously with brown bands and spots. Pterostigma opaque, moderately deep, R_1 subangulate; a spot of variable size in distal half of cell; a smaller spot just below R_1 continuing the pterostigmal spot. Wing otherwise marked by: an irregular band extending from base of pterostigma to cell 1A;

base of wing especially at veins faint brownish; basal two-thirds of cell 2A, brown; about three small spots proximally in cell R_5 ; a broad band borders outer wing margin but the pigment attains wing margin only at end of veins. Veins brownish—except R_1 which is white—paling proximally with or without r-m cross-vein. Inner and costal wing margin of hind wing faintly clouded with brown, otherwise hyaline.

Abdomen irregularly and variously marked with brown mixed with purple and grey. Terminal segments and genitalia (Pl. XIII, Fig. 6). Proximal portion of subgenital plate consisting of a pair of small irregular plates. The base of the egg-guide arrow-shaped, as in related forms, but distally the structure widens and is almost truncate; the egg-guide uniformly chitinized except at apex and there a row of five or six strong hairs—a conspicuous one on each side of a median notch in the chitinization. Ventral gonapophyses very slender, short. Lateral gonapophyses white, cup-shaped with the distal portion lobe-like and extending behind the dorsal gonapophyses; a row of hairs divides the basal third from the non-chitinized apical portion. Dorsal gonapophyses with a long, drawn out, bent point. Sense tubercles on paraprocts dark brown. The evenly rounded distal margin of the suranal plate bears a series of seven conspicuous hairs: a short median one, with a pair on each side of equal length, laterally two pairs of much longer ones.

New York: Michigan Mills, Lewis Co., Sept. 1, 1926, 9 ♀, on both dead and living hemlock and spruce limbs; Parkers, Lewis Co., Sept. 2, 1926, 21 ♀, chiefly on dead spruce and hemlock limbs; Whetstone Gulf, Lewis Co., Sept. 2, 1926, 11 ♀, on dead hemlock; Nigger Pond, Oswego Co., Sept. 3, 1926, 2 ♀; McLean, July 31, 1926, 17 ♀, 4 nymphs, on dry hemlock boughs in shade; Artists Lake, Suffolk Co., Sept. 19, 1926, 2 ♀; Geneseo, Sept. 20, 1925, 1 ♀, on tree trunk.

Maine: Southwest Harbor, Mt. Desert Island, Aug. 31, 1926, 2 ♀ (C. P. Alexander); Beech Mt., Mt. Desert Island, Sept. 12, 1926, 1 ♀ (C. P. Alexander).

New Hampshire: Gorham, 1868 (Hagen) 1 ♀, M. C. Z.

Massachusetts: Auburndale, Sept. 22, 1907, 1 ♀ (C. W. Johnson), M. C. Z.

Maryland: Chesapeake Beach, June 18, 1914, 1 ♀ (L. O. Jackson), M. C. Z.

Virginia: Falls Church, July 3, 1 ♀, Oct. 10, 2 ♀ (Banks), M. C. Z.; Delapone, Sept. 10, 1 ♀ (Banks), M. C. Z. London Bridge, Aug. 25, 1929, 3 ♀.

Illinois: Rock Island, 1864, 1 ♀ (Walsh), M. C. Z. Paratype (?).

Psocus purus Walsh

Psocus purus Walsh. Acad. Nat. Sci. Phila. Proc. **14**: 361. 1862.

Psocus lucidus Harris. Ent. Corresp., p. 328. 1869.

Psocus genualis Banks. N. Y. Ent. Soc. Jour. **11**: 236. 1903.

Female:

Length of body 4.3–4.8 mm.

Length of fore wings 5.0–5.6 mm.

Length of antennæ 6.0–6.8 mm.

Generally ivory white, marked with black and fuscous.

Head: Two large elongate fuscous spots on vertex; a small one completely surrounding ocelli; another large roughly circular one on clypeus touching the posterior margin; genæ unmarked; clypeus faintly lineated; labrum coarsely touched with fuscous. Eyes black. Maxillary palpus white, terminal segment dusky at tip. Antennæ very slender, first three segments pale; median ones deep brown, apical ones paling.

Thorax: Markings on pleuræ indistinct. Tergal lobes irregularly covered with shining black; white areas between lobes broad; on tergum of metathorax four black spots arranged in a curved transverse series, lateral spots larger. Legs pale, tarsi fuscous. Above, proximally on tibia, a black spot; one distally, above on femur. Probably the most characteristic marking (Pl. XX, Fig. 2) occurs on vein R_1 which is white for half its length, then dark brown in the distal half; the change occurs before the inner angle of the pterostigma. Veins conspicuous, brown, paling proximally. The wing entirely hyaline except for a faint fuscous area in cell R_5 behind R_s furcation; a dark spot at wing hooks located at base of pterostigma and at end of anal cells. Cross-vein r-m present or not; if present, short. Hind wing hyaline, unmarked.

Abdomen irregularly and usually indistinctly marked with fuscous above; rather distinct suture stripes on the sides in some individuals. Genital structures (Pl. XII, Fig. 7) similar to those of *novaescotiae*. Subgenital plate consists of two independent parts; the proximal part small, triangular, flap-like and notched apically. The egg-guide, arising independently, elongate, white, sparsely pilose apically and supported laterally at the base by a pair of independent chitinized strips. Ventral gonapophyses strong, very long, slender. Lateral gonapophyses white, curved, cup-shaped, half as long as wide, sparsely pilose. Dorsal gonapophyses very large, fleshy, trough-shaped, truncate, without apical knob or point. The rami appear to be a single stout piece but like *novaescotiae* actually h-shaped (looking at left gonapophyses). Sense tubercles on paraprocts white, much elevated, partially set in a black field. Suranal plate triangular but nearly truncate apically, dusky stripe medianly.

Male:

Length of body 3.8–4.5 mm.

Length of fore wings 5.0–5.5 mm.

Length of antennæ 7.0–8.0 mm.

Markings as in female; antennæ much stouter; hairs two or three times longer.

Abdomen slender, curved. Hypandrium asymmetrical (Pl. XV, Fig. 20). A ventral part, drawn out into a gently pointed beak-shaped piece. Above this is borne the quadrate distal part, featured by a pair of lateral plates arising almost perpendicularly—thus creating a trough-shaped structure—the interval between plates pilose. Structures on the right side are: on the perpendicular plate a short tooth dorsally; a long strongly chitinized prong, evenly rounded apically, proceeding dorsally and cephalically from its origin back of the trough-shaped piece and at the right distal margin of hypandrium; below base of this prong a small, roughly circular, chitinized tubercle. On the left side: the perpendicular plate is produced ventrally into a large posteriorly pointing prong; the rim further adorned dorsally by two teeth (or three if the pointed rim apex be counted); arising from a position comparable to the strong prong on the right a short, flat piece which is blunt-pointed; below and distinctly

separated from the trough-shaped piece occurs a large, elongate, highly chitinized protuberance produced distally into a disc with the flat surface uppermost. Parameres fused, symmetrical, somewhat 0-shaped basally. Paraprocts often uniformly white, similar in shape to *novaescotiae*; sense tubercles white, small, much-elevated; claw arising from lower margin of moderate size. Suranal plate broadly "notched" basally, apex evenly rounded.

New York: Ithaca, Aug. 30, 1926, 5 ♂, 4 nymphs, in slight depressions on moderately dry rock cliff, Sept. 6, 1926, 10 ♀ 6 ♂ on bark of dead beech snag associated with *Psocus leidyi* Aaron, Aug. 13, 1895, 1 ♂ (N. Banks) M. C. Z.; Fairhaven, Sept. 7, 1924, 5 ♀ 1 ♂ on lower surface of loose stones; Cairo, Aug. 17, 1925, 1 ♀ under loose bark of apple; Sea Cliff, Aug. 6, ♂ on cedar, 2 ♀ 1 ♂ on pear (N. Banks) M. C. Z.

Massachusetts: Cambridge, 1 ♀ 1 ♂ M. C. Z. Ms notes of Harris: "Aug. 15, 1832 on side of house. On window in privy Sept. 1–Oct. 20, 1836." Specimens in collection bear date Sept. 6, 1837; another "numerous on fences." Types of *Psocus lucidus* in Boston Nat. Hist. Soc.

Rhode Island: Kingston, Sept. 1, 1907, 2 ♂ (Banks) M. C. Z.

Pennsylvania: Philadelphia, 1 ♂ (S. F. Aaron) M. C. Z.; Rockville, July 29, 3 ♀ 1 ♂ (Banks) M. C. Z.; Carrville, Aug. 2, 2 ♀ (Banks) M. C. Z.

Maryland: Plummers Island, July 24 1 ♀ (Banks) M. C. Z.

Virginia: Falls Church, Sept. 3 ♀ 3 ♂ (Banks) M. C. Z.

North Carolina: 1 ♂ (Morrison?) M. C. Z.

Illinois: Rock Island, 1863, 1 ♀ (B. D. Walsh) M. C. Z. Paratype sent to Hagen.

Texas: Austin, June, 1901, 1 ♀ M. C. Z. Holotype of *Psocus genualis* Banks.

Psocus purus Walsh resembles *leidyi* and *novaescotiae* and with the latter is closely related. This species inhabits such places as stones, cliff walls, tree trunks and dwellings. *P. leidyi* may share the same location. Of historic interest are the observations of Harris on this species; apparently he knew it well, having made collections and observations as early as 1832. The Ms. name *Psocus lucidus* cannot stand because his notes remained unpublished until 1869—Walsh named the species *purus* in 1862.

Psocus genualis Banks is, as an examination of the holotype revealed, a female of this species.

***Psocus quaesitus* new species**

Female:

Length of body 2.9 mm. ave. of 8 individuals.

Length of fore wings 3.8 mm. ave. of 8 individuals.

Length of antennæ 4.0 mm. ave. of 3 individuals.

Essentially identical with *slossonæ* in general appearance and markings, including those on wings. The markings are probably darker and the corresponding colored areas, larger.

Genital processes (Pl. XIII, Fig. 10) differ from *slossonæ* as follows: The subgenital plate consists of a pair of plates roughly equilateral triangular in shape; egg-guide short, broad, with rectangular chitinized central portion; bearing medianly a weakly chitinized thin strip which widens and involves the nearly truncate pilose apex; on each side of the egg-guide, at the base, weakly chitinized triangular plates; the lateral gonapophyses considerably shorter.

Male:

Length of body 2.6–2.8 mm.

Length of fore wings 3.7–3.9 mm.

Length of antennæ about 3.8 mm.

Markings as in female, often paler. Eyes large. Genital process (Pl. XV, Fig. 10) symmetrical except for a pair of slender arms arising from distal margin of hypandrium. Midway distally on hypandrium a large highly chitinized piece, consisting of an elongate distal portion and a pair of curved basal arms bent mesally to form the letter "O."

The asymmetrical arms already mentioned lie on each side and below this median piece; the left prong extends to the end of the median piece, while the right one arising somewhat lower, curves below the median piece, and extends beyond the left prong. A pair of chitinized strips bordering the lateral margins of hypandrium and a branch attached to the base of the asymmetrical prongs give rise to a pair of elongate less highly chitinized capsule-like pieces. Two chitinized bands lie one above the other at base of hypandrium. Laterally on 9th tergite a pair of blister-like cushions nearly touching the capsule-shaped pieces. Parameres fused, consisting of two flat arms joined to form a heart-shaped structure; proximally it is attached to the basal sclerite. The brown sense area is well towards the base of the paraprocts which distally are slender and terminate in the usual upward-pointing prong. Arising from the suranal plate perpendicularly a curious weakly chitinized plate which in profile consists of a pair of lateral lobes and medianly, of a sharp peak.

New York: Michigan Mills, Lewis Co., Sept. 1, 1926, 5 ♀ on dead hemlock and spruce limbs associated with *P. pollutus*; Gen-

eseo, Sept. 20, 1925, 1 ♀ on partially dead oak limb; Ithaca, Sept. 6, 1926, 1 ♂ on dead limb Holotype; Richburg, Sept. 16, 1925, 1 ♀; Parkers, Lewis Co., Sept. 2, 1926, 1 ♀; Artists Lake, Suffolk Co., Sept. 19, 1926, 1 ♀ on dead limb; Nigger Pond, Oswego Co., Sept. 3, 1926, 1 ♂; McLean, July 31, 1926, 1 ♀ on dry hemlock boughs in shade, associated with *P. pollutus*.

Psocus quietus Hagen

Psocus quietus Hagen. Syn. Neuropt. of N. A. p. 12. 1861.

Psocus semistriatus Walsh. Acad. Nat. Sci. Phila. **14**: 361. 1862. In part—1 ♀ 1 ♂ of Paratypes.

P(socu)s semistriatus Hagen and Walsh. Ent. Soc. Phila. Proc. **2**: 167, 182. 1863.

P(socu)s bifasciatus Walsh. Ent. Soc. Phila. Proc. **2**: 183. 1863. Not *P. confraternus* as surmised by Banks.

Blaste juvenilis Kolbe Stett. Ent. Zeit. **44**: 80. 1883.

Female:

Length of body 3.55 mm. ave. of 6 individuals.

Length of fore wings 4.4 mm. ave. of 6 individuals.

Length of antennæ 3.2 mm. ave. of 6 individuals.

Considerable variation in the intensity of markings. Head and thorax strongly marked with brown, the abdomen with dark grey or dark cinnamon brown.

Head: Dotted areas of vertex distinct or sometimes the lateral pigmented areas without distinct spots. A large brown spot covers the ocelli and extends over the front and slightly into the clypeus; clypeus strongly lineated with rich brown; on the anterior two-fifths a pair of distinct dark brown spots which vary considerably in size (in some specimens totally absent); genae white with a distinct brown spot medianly; posterior half of clypeolus and all of labrum brown. Eyes black; antennæ brown.

Thorax: Pleuræ irregularly marked with equal amounts of brown and white. Tergal lobes shining dark brown or black. Legs pale brown, the femora mottled with brown above. Wings: hyaline (Pl. XX, Fig. 16), largely covered with faint brown. Pterostigma: opaque, rather shallow, R₁ gently curved; a characteristic elongate dark greyish brown spot in inner "angle," only a slight amount of pigment below the cell. Distal third of

wing faintly brownish. An incomplete pale brown band from base of Rs to end of cell 1A together with another shorter one proximally; these are connected horizontally so that the total marking is H-shaped. Veins dark brown paling proximally; cross-vein r-m present or not. Hind wings unmarked.

Abdomen irregularly splotted or striped with dark grey or deep cinnamon brown; pigment largely confined to tergites. Terminal abdominal segments and genital processes (Pl. XII, Fig. 14) dark brown. The basal portion of the subgenital plate an inverted V-shaped piece giving rise at the apex to the broad, short, arrow-shaped egg-guide, the apex of which is blunt pointed and weakly chitinized. Ventral gonapophyses rather slender, extending a short distance beyond the egg-guide. The basal portion of the lateral gonapophyses swollen, strongly chitinized, pilose; the apical portion weakly chitinized, white. Dorsal gonapophyses with a long drawn out, chitinized apex. Suranal plate triangular, blunt pointed, bearing distally a row of five setæ—a pair of long lateral ones and three short median ones.

Male:

Length of body 3.0 mm. ave. of 5 individuals.

Length of fore wings 3.7 mm. ave. of 5 individuals.

Length of antennæ 3.5 mm. ave. of 5 individuals.

Marked as in female, possibly somewhat darker. The wings inclined to be uniformly faint fumose. Eyes black, larger than female. Antennæ rather stout, dark brown.

Genital processes (Pl. XIV, Fig. 3) symmetrical, dark brown. Hypandrium proper with the apex bearing a strongly chitinized semicircular piece, laterally on which arise a pair of short, sharp, dorsally pointing prongs, and arising between these a triangular piece with a thin, conspicuous, highly chitinized median rib. The parameres independent, consisting of a pair of long stout arms which arise from a small triangular plate which bridges hypandrium and the basal sclerite. Each paramere swollen distally, terminating in a sharp, lateral pointing hook. Sense tubercles on paraprocts large, brown, the apical portion twisted, bearing a short, plate-like, upward pointing prong. Suranal plate triangular, chitinized except a circular part at apex.

New York: "N. Y." M. C. Z. Holotype; Saratoga Springs, July 14, 1926, 20 ♀ 31 ♂ 1 nymph, on live branches of oak; Parkers, Lewis Co., Sept. 2, 1926, 6 ♀; Ithaca, July 11, 1926, 3 ♂ on dead limbs; Aug. 1, 1926, 1 ♀; Sept. 26, 1926, 1 ♀, Aug. 6, 1926, 2 ♀, Sept. 12, 1926, 2 ♀ 3 ♂ on dead poplar limbs; Ballston Lake, July 14, 1926, 1 ♀; Geneseo, Sept. 20, 1925, 2 ♀ on dead oak limbs; Whetstone Gulf, Sept. 2, 1926, 1 ♂; West Barre, Sept. 19, 1925, 1 ♀; Sodus, Aug. 16, 1926, 1 ♀.

Massachusetts: Cambridge, Sept. 1 ♀ (Banks). Holotype of *P. stigmatialis*.

Maine: Beech Mt., Mt. Desert Island, Sept. 12, 1926, 1 ♀ 1 ♂ (C. P. Alexander); Southwest Harbor, Mt. Desert Island, Aug. 31, 1926, 1 ♀ (C. P. Alexander).

Virginia: Blacksburg, Oct. 4, 1926, 2 ♀ 1 ♂ 2 nymphs (C. & B.); Mt. Vernon, Oct. 28, 1926, 1 ♀ (C. & B.), deer park fence; London Bridge, Aug. 25, 1929, 3 ♀ 1 ♂.

Tennessee: Bristol, Oct. 5, 1926, 7 ♀ 1 ♂ (C. & B.) taken at light of Coca-cola stand; Laurel Creek, Sevier Co., Oct. 8, 1926, 1 ♂ (C. & B.).

Kentucky, Quicksand, June 25, 1925, 1 ♀.

North Carolina: Mt. Pisgah, Oct. 14, 1926, 1 ♀ (C. & B.).

Georgia: Tiger, Oct. 18, 1926, 1 ♀ (C. & B.).

Illinois: Rock Island, 1864, 1 ♀ (Walsh) M. C. Z. Paratype of *Psocus semistriatus*.

Psocus slossonae Banks

Psocus slossonae Banks. Jour. N. Y. Ent. Soc. 11: 236. 1903.

Female:

Length of body 2.7–3.0 mm.

Length of fore wings 3.5–3.8 mm.

Length of antennæ about 3.8 mm.

Pale buff marked with brown and brown diffused with grey; decidedly pale above, most of the markings below.

Head: Pale buff above marked with indistinct brown dots on vertex; on front, a pair of lateral spots and a V-shaped one touching anterior ocellus; clypeus coarsely lineated—lineation fading out towards posterior margin; the anterior half or more of clypeus bears marks as in *desolatus* and *quaesitus* consisting of

three triangular brownish areas the vertices of which fuse medianly; posterior third of clypeolus and anterior three-fourths of labrum brown; genae brownish white medianly. Compound eyes large, dark, phosphorescent bluish-green. Third joint of maxillary palpus pale, remainder brown. Antennæ pale, median segment dark.

Thorax: Dorsal half of pleurae brown, remainder light tan; tergal lobes dull bluish white, irregularly marked with tan, especially laterally. Legs white at joints; coxae and femur of metathoracic legs brown; femora of other legs with broad ring of brown proximally and distally; ring or spot distally on tibia; tarsi brown. Wings (Pl. XX, Fig. 3) hyaline, beautifully marked with tan and dark brown, characterized by a series of six dark brown dots in the apical portion of wing. Pterostigma deep, but R_1 not angulate; basal third or half of cell whitish, margined with yellowish, unmarked; a small dark spot covers base, and a large irregular one on the apical half of cell. Wing further marked by an area between pterostigma and Cu, involved with brown dots; a brown band from base of pterostigma—widening as it proceeds—to cell 1A where it ends abruptly; two dark spots in basal portion of cell 2A; wing proximal of stripe slightly dotted, pale tan along costal margin; an incomplete tan band from apex of pterostigma to cell Cu_1 , composed of four or five spots; a tan band borders outer margin of wing attaining the margin at end of veins where is found a dark brown spot, *inside the band lie the six characteristic dark brown spots*. Veins brown, fading proximally. M usually broadly joined to Rs. Hind wings hyaline, essentially unmarked.

Abdomen: Conspicuously colored pale tan. On sides a few small irregular brownish spots, chiefly at sutures; uniform brown diffused with grey below, sutures pale. Basal portion of subgenital plate (Pl. XIII, Fig. 7) consisting of a pair of widely separated elongate rather irregular plates. Egg-guide short, broad, somewhat arrow-shape but the apex broad; a row of hairs at apex; weakly chitinized medianly. Ventral gonapophyses short, slender, inconspicuous. Lateral gonapophyses consisting of a basal piece which is very short and broad, white and pilose; the distal portion non-pilose and drawn out laterally so that it ex-

tends slightly behind the dorsal gonapophyses. Dorsal gonapophyses of moderate size ending in a sharp, much drawn out chitinized point. Paraprocts and sense tubercle pale brown. Suranal plate gently pointed, supported laterally by short arms.

Male:

Length of body about 2.3 mm.

Length of fore wings about 3.7 mm.

Markings as in female, somewhat paler throughout. Eyes very large. Hypandrium (Pl. XV, Fig. 11) symmetrical, roughly quadrate; distally and laterally arise long, slender, mesally pointing arms; the distal portion weakly chitinized, broadly notched; mesally on the chitinized plates from which the arms arise an area sparsely pilose. Arising just below the junction of these pieces, a straight, slender, weakly chitinized, tassel-like piece, extending to distal margin of hypandrium. Basal portion of hypandrium consisting of two pieces as denoted by a pair of deep notches laterally—the upper piece triangular, sparsely pilose mesally; the lower part a narrow band. Parameres united, forming an angular O-shaped piece; fused distally, at which point arises a pair of short, highly chitinized, sharp pointed prongs. From the ninth tergite arises a pair of flat, blunt, hook-shaped pieces lying above lateral arms on hypandrium. Paraprocts lobe-like, the tooth arising apically, sharp and strong; sense tubercles flat, brown. From the base of the white, broadly triangular suranal plate arises perpendicularly a thin, concave, shell-like piece, which in profile consists of a pair of lateral lobes with the interval between straight.

New York: Ithaca, Sept. 12, 1925, 1 ♀ on bark of beech stump; Ceres, Sept. 16, 1925, 1 ♀ on trunk of ironwood; Richburg, Sept. 16, 1925, 1 ♂.

New Hampshire: Franconia, 2 ♀ M. C. Z. Holotype and Paratype.

Maine: Southwest Harbor, Mt. Desert Island, Aug. 31, 1926, 2 ♂ (C. P. Alexander); Beech Mt., Mt. Desert Island, Sept. 12, 1926, 1 ♀ (C. P. Alexander).

Tennessee: Bristol, Oct. 5, 1926, 1 ♂ taken at light of Coca-cola stand (C. & B.).

Psocus striatus

Psocus striatus Walker. Cat. Neuropt. Brit. Mus. p. 486. 1853.

Psocus frontalis Harris. Ent. Corresp. p. 330. 1869.

Female:

Length of body 3.9 mm. ave. of 3 individuals.

Length of fore wings 4.3 mm. ave. of 3 individuals.

Length of antennæ 3.8 mm. ave. of 2 individuals.

Head: Dotted areas on vertex conspicuous; front with a brown dot or two laterally and a faintly V-shaped mark medianly; clypeus pale yellowish, lined with rather broad, brown lines which do not attain the anterior margin; posterior half of clypeolus and nearly all of labrum brown; genae unmarked. Antennæ brown. Eyes small, dull bluish black.

Thorax strongly marked with dark brown, a whitish line medianly above. Legs pale, tarsi brown. Wings (Pl. XX, Fig. 7) hyaline marked with rich chocolate brown. The pterostigma opaque, deep, R_1 rather sharply angulate; in about the distal third of the cell a dark brown spot extending below R_1 but preserving a characteristic small white area in the cell at the angle. An irregular spot in cell R_5 behind fureation of R_s ; an incomplete band extending from base of pterostigma to end of anal veins; basal half of cell 1A brown. This group of markings roughly forms the outline of a right-angled triangle, the base of the triangle being the anal wing margin, a line from end of anal vein to base of pterostigma from which point to the base of vein 2A completes the figure. Veins conspicuous, brown. M just touches or is not broadly joined to R_s . Hind wing hyaline, unmarked.

Terminal abdominal segments and genital processes (Pl. XII, Fig. 5). Subgenital plate consisting of a broad, rather narrow plate varying in the degree of chitination as indicated in the figure. Pyramided on this medianly, a pair of lateral plates, then a single median piece and finally the extremely slender egg-guide. The ventral gonapophyses easily visible, rather strong, extending well beyond the apex of the egg-guide. Lateral gonapophyses large, cup-like, strongly chitinated proximally, pilose and bearing a row of hairs along the distal margin. Dorsal

gonapophyses blunt-pointed the rami extend almost to the apex, and infuscated area along mesal margin. Sense tubercles of paraprocts brown. An unchitinized area basally on suranal plate forms and equilateral triangle; midway the rather broad chitinized lateral strips bend below; the apex swollen, evenly rounded, unchitinized.

Male:

Length of body 3.4 mm. ave. of 2 individuals.

Length of fore wings 4.3 mm. ave. of 4 individuals.

Length of antennæ 4.5 mm. ave. of 2 individuals.

Marked as in female. Eyes small but still considerably larger than female. Genital processes asymmetrical occupying less of the abdomen than those of the female. Hypandrium jaw-like (Pl. XV, Fig. 14) with a long, rather broad, median chitinized ridge which turns slightly to the left distally and finally bends abruptly cephalad. On the left margin of hypandrium connecting the apex of the median ridge with the base and suspended midway between each by slender strips, an elongate irregular plate. The conspicuous parameres fused (Pl. XV, Fig. 17) and strongly chitinized, decidedly asymmetrical and generally triangular in shape. Viewing the structure *in situ*, on the right side arises a large thumb-like projection covered with tubercles, the mesal margin at the base beset with a row or two of stout teeth (not visible with structures *in situ*). On the left a similar thumb-like projection beset with tubercles, shorter, more crooked, not definitely dilated distally and basal portion much smaller. Arising from the strip between the two "thumbs" and close to the left projection, a non-tuberculate conical prong; it is not as long as the left projection. The basal portion consists of slender arms which fuse basally to form a roughly diamond-shaped plate. Sense tubercles flat; at point of attachment paraprocts bear a small highly elevated tubercle, and distally a rather flat, upward pointing prong. Suranal plate gently pointed, arrow-shaped.

New York: Ithaca, Sept. 6, 1926, 1 ♂, July, 1901, 2 ♂ at light in Fall Creek, Aug. 22, 1926, 1 ♀; Clarksburg, Sept. 18, 1925, 1 ♀.

District of Columbia: Washington, 1860, 1 ♂ (O. Sacken).

Missouri: Columbia, Sept. 1905, 1 ♀ (C. R. C.).

***Psocus subapterous* new species**

Male:

Length of body 3.2 mm. ave. of 5 individuals.

Length of fore wings 4.5 mm. ave. of 5 individuals.

Length of antennæ 3.0 mm. ave. of 5 individuals.

Closely related to *P. longipennis*, *quietus*, *subquietus* and *oregonus*.

Arms of epicranial suture fused to clypeus forming a small elliptical front. Clypeus faintly lined, adorned with four large spots as in *cockerelli*. Labrum brown; a distinct spot on genæ. Antennæ pale brown.

Wings hyaline or subhyaline, unmarked (Pl. XX, Fig. 14). The pterostigma long and shallow, non-angulate (similar to *longipennis*). Veins distinct, light brown. Considerable variation in the way that M is joined to Cu, ranging from a definite fusion for a short distance, to a condition such as obtains in *confraternus*.

Terminal abdominal segments and genitalia very similar to *subquietus* (Pl. XIV, Fig. 1) from which this species differs as follows: basal sclerite broader; the median prong of the distal processes of hypandrium long and pointed and with a more strongly chitinized median portion or core; the lateral hooks are directed only slightly mesally and their inner line forms an even curve; parameres show some differences as figured. The distal prong on the paraprocts triangular, appearing as if a notch had been made at apex of paraproct. Suranal plate triangular weakly chitinized apically. Female (subapterous):

Length of body 3.5 mm.

Length of antennæ 2.0 mm.

Similar in markings to male, much stouter. Eyes equal those of male in size but head of male only about one-third as large as female.

Wings reduced to two pairs of buds of which those on mesothorax bear three longitudinal ridges—the median ridge forked distally. Prothorax greatly reduced although tergal lobes of meso and metathorax much reduced over condition found in winged members of the genus.

Genital process similar to those figured for *quietus* and *oregonus*.

California: Sequoia National Park, Aug. 11, 1927, 1 ♀ 11 ♂ on Douglas fir (J. D. Hood). Holotype (♂) Paratypes. Allotype.

This is the only member of *Psocus* known to me in which the wings are reduced to a nearly apterous condition: some females of *P. longipennis* are brachypterous. I have found no previous record of the existence of short winged or subapterous individuals in the family Psocidae in this country or elsewhere in the world.

Psocus submarginatus Aaron

Psocus texanus var. *submarginatus*. Acad. Nat. Sci. Phila. Proc. **38**: 16. Pl. 1, Fig. 1, 1886.

Psocus submarginatus Enderlein. Stett. Ent. Zeit. **67**: 317. 1906.

Although it was only possible to make a cursory examination of the type series, *submarginatus* appears to be a distinct species and not, as indicated by Aaron, a variety of *texanus*. An excellent figure of the markings on the fore wing accompanies the original description and this and the size (length 3 mm.) should enable one to recognize the species.

Psocus subquietus new species

Female:

Length of body 3.4 mm. ave. of 5 individuals.

Length of fore wings 4.3 mm. ave. of 5 individuals.

Length of antennæ 3.15 mm. ave. of 5 individuals.

This species so closely resembles *quietus* that no sufficiently constant characters have been found to separate this species except in the male genitalia. The genitalia of the females appear to be identical. A character which is moderately constant is the markings on the vertex; in this species the epicranial suture is devoid of markings, or only faintly marked, while on each side lie large roughly square greyish purple spots (in nymphs and teneral individuals of both species these spots are found).

Male:

Length of body 3.0 mm. ave. of 5 individuals.

Length of fore wings 4.2 mm. ave. of 5 individuals.

Length of antennæ 3.85 mm. ave. of 5 individuals.

The genitalia (Pl. XIV, Fig. 15) differ from *quietus* as follows: Apically on hypandrium arises medianly a long, uniformly chitinized, drawn out, blunt-pointed prong (or with an indication of a slight fork); this prong is the termination of a distinct broad ridge which becomes distinctly swollen distally; on each side of this median prong a pair of mesally pointing claws, the strongly chitinized support of which lies along the lateral margins of the hypandrium, having no connection with the median piece as in *quietus*. The basal plate from which the parameres arise large, heart-shaped, the parameres similar to *quietus*, each arm is shorter.

New York: Ballston Lake, July 14, 1926, 7 ♀ 4 ♂ on dead limbs Holotype; Ithaca, July 11, 1926, 3 ♂ on dead limbs, Aug. 6, 1926, 2 ♀, Sept. 26, 1926, 2 ♀; Michigan Mills, Sept. 1, 1926, 2 ♀; Painted Post, Sept. 15, 1925, 2 ♀ 1 ♂ on dead hemlock limbs;

Nigger Pond, Oswego Co., Sept. 3, 1926, 2 ♀; Woodwardia Swamp, Tompkins Co., Aug. 10, 1924, 2 ♀ 10 nymphs under loose stones.

Tennessee: Bristol, Oct. 5, 1926, 4 ♀ (C. & B.) taken at light of Coca-cola stand.

***Psocus texanus* Aaron**

Psocus texanus Aaron. Acad. Nat. Sci. Phila. Proc. 38: 16. 1886.

Female:

Length of fore wings 3.8 mm. ave. of 2 individuals.

Length of antennæ 3.8 mm.

Head: The usual dotted areas on vertex present; on the front a U-shaped mark and a pair of lateral spots; clypeus lined with moderate sized brown lines; a spot on genae. Eyes dull black, rather large.

Thorax: Tergal lobes shining dark brown. Legs pale, a brown spot inside, proximally on tibia; tarsi brown. Wings (Pl. XX, Fig. 22) hyaline marked with brown; the pterostigma opaque, rather deep, R_1 angulate, a brown spot distally and a smaller one below it touching R_1 ; a pale brown spot in cell R_5 just behind R_s furecation; distal third of wing faintly fumose. A distinct brown band from base of pterostigma to end of cell 1A; vein R and anal veins margined with brown, R_1 white. Vein M fused with R at a point. Hind wing hyaline, a pale brown spot at end of anal veins.

Terminal abdominal segments and genitalia (Pl. XII, Fig. 12). Subgenital plate U-shaped with the arms short and margins very irregular. The egg-guide short with pilose apex broad, rounded. The chitinized supports of the egg-guide V-shaped, the arms end before the apex. Ventral gonapophyses relatively stout, ending in a sharp point. Lateral gonapophyses large, broad, a sleeve-like structure with a pilose, strongly chitinized basal part and a nearly truncate distal portion. Dorsal gonapophyses trough-shaped with a much drawn out chitinized apex; rami strongly chitinized, stout; a large brownish area borders the mesal margin. Paraprocts short, with sense area brown,

large. Suranal plate with a median non-chitinized area at the base which is deep, crescent-shaped; apex blunt pointed.

Male:

Length of fore wings 3.7 mm.

Length of antennæ 3.7 mm.

Marked as female. Eyes large, dull black. Genitalia brown, asymmetrical. Hypandrium (Pl. XV, Fig. 21) jaw-like, bearing medianly a large, broad, elongate piece which terminates in a narrow cap. This median piece bears three ridges; when viewed from the rear, the right margin strongly chitinized and elevated, distally, twisting to the left; on the left side a pair of small narrow ridges arising near the base, running nearly parallel and twisting to the left. (In a lateral view an area proximo-ental of this ridge set with short spines. The other "ridge" terminates as an upward directed arm.) The parameres fused; elongate, trapezoidal in shape, the asymmetrical distal portion consisting of an irregular arm visible to the left of the apex of the hypandrium, and a blunt pointed prong and laterally a large plate or lobe-like piece; on the right a smaller lateral lobe. Paraprocts long, angular, the sense tubercles distal of half way, while terminally a moderate sized upward pointing prong. Suranal plate longer than wide, a non-chitinized basal portion equilateral triangular in shape.

Texas: Described from 1 ♂ and 2 ♀. Paratypes kindly supplied by E. T. Cresson, Jr., from Aaron's type series in the Philadelphia Academy of Natural Sciences.

Psocus trifasciatus Provancher

Psocus trifasciatus Provancher. Natur. Canad. 8: 186. June, 1876.

Psocus speciosus Aaron. Amer. Ent. Soc. Trans. 11: 40. Pl. 9, Fig. 7. 1883.

Cerastis nigrofasciatus (Hagen) Kolbe Stett. Ent. Zeit. 44: 70. 1883.

Psocus tolteca Banks. N. Y. Ent. Soc. Jour. 11: 237. 1903.

Cerastipsocus nigrofasciatus Enderlein. Stett. Ent. Zeit. 67: 318. 1906.

Cerastipsocus trifasciatus Banks. Cat. Neuropt. Ins. U. S. p. 10.
1907.

Female :

Length of fore wings 4.7–5.1 mm.

Length of body 4–4.3 mm.

Length of antennæ 7–8 mm.

Head yellowish white, thorax and abdomen brown, wings conspicuously marked with three bands of brown.

Head whitish above, faintly marked with orange in the position of the usual dotted areas. Ocelli deep brown or black. A wide light brown V on front. Clypeus lineated with light brown lines of moderate width. Proximal half of labrum brown. Genae concolorous with vertex, unmarked or only faintly so. Maxillary palpus brown deepening distally. Eyes dull black. Third segment of antennæ pale, deepening to dark brown distally.

Thorax: Tergal lobes dark, shining brown margined with whitish: Pleurae and coxae brown. Femora pale, tibiae and tarsi brown. Wings (Pl. XX, Fig. 21) hyaline, largely marked with brown. Pterostigma short, very deep and subangulate. This cell is opaque, white in proximal two-thirds and brown distally. Distal half of wing with three bands diverging from cells Cu_1 and M_3 : the proximal margin of one runs from the base of Rs across to cut cell Cu_1 in half; another extends along wing margin from Cu_1 to R_{4+5} or slightly beyond (may not attain margin except at veins); the other lies between these two, lining up with distal spot in pterostigma. There is a hyaline band running across the wing through the middle of cell M; proximal to this the wing is largely brown except for a large hyaline spot on vein M Cu and several smaller ones on cell 1A. Generally veins white in proximal half of wing, brown in distal half. Hind wings hyaline, unmarked.

Abdomen a purplish brown, paling below and pale at sutures. Genitalia and terminal segments (Pl. XII, Fig. 11) similar to *venosus*. The subgenital plate a rather narrow bar, widening and slightly notched laterally. The egg-guide is urn-shaped with the apex swollen, weakly chitinized, pilose and with a slight depression. A slender weakly chitinized core lies in distal half

of egg-guide. Ventral gonapophyses of usual shape, long. Lateral gonapophyses large, weakly chitinized; basal third more strongly chitinized, pilose; distal two-thirds non-pilose, fitting sleeve-like to dorsal gonapophyses. Dorsal gonapophyses shallow, trough-shaped, weakly chitinized, apex pointed; infuscated area inside distally and mesally. Sense tubercles of paraprocts concolorous with brown lateral surface of paraprocts. An infuscated area covered with tiny spines at base of paraprocts mesally on ventral surface. Suranal plate triangular, weakly chitinized and with five or six stout spines distally.

North Carolina: "N. C." 5 ♀ (? sex) (Morrison) M. C. Z.; "N. C." 2 ♀ (? sex) Morrison. Types of *Psocus speciosus* Aaron P. A. N. S.; Goldsboro, Sept. 1903 (F. Sherman) 1 ♀ M. C. Z.

Kentucky: "Ky." May, 1 ♀ (Sanborn), June, 1 ♂ labelled "*Ps. nigrofasciatus* Hagen" apparently in Hagen's handwriting.

Virginia: Falls Church, 2 ♀ (? sex) (Banks) M. C. Z.

Georgia: Tallulah Falls, 18 Oct. 1926, 1 ♀ (C. R. C.).

Arizona: Ruby, Aug. 30, 1927, 1 ♀ on dead yucca or agave (J. D. Hood).

Psocus variabilis Aaron

Psocus semistriatus Walsh. Acad. Nat. Sci. Phila. Proc. **14**: 361. 1862. Partim.

Psocus variabilis Aaron. Am. Ent. Soc. Trans. **11**: 38. Pl. 9, Fig. 5. 1883.

Psocus medialis Banks. Jour. N. Y. Ent. Soc. **15**: 165. 1907.

Female:

Length of body 3.0 mm.

Length of fore wings 3.6 mm.

Yellowish white, sparsely marked with brown. Head with a brown area involving ocelli and epicranial suture; the other areas on vertex dotted, faint; clypeus faintly lineate, a distinct pair of brown spots on posterior two-fifths; genae unmarked; labrum brown. Eyes of moderate size, dull black.

Thorax: Tergal lobes shining brownish black. Legs pale. Wings (Pl. XX, Fig. 8) uniformly hyaline throughout. Pterostigma of moderate depth, R₁ gently rounded. Veins yellow or light brown. M joined with Rs for a short distance.

Abdomen: Spotted with fuscous above, and three or four stripes on the sides. Terminal segments and genital processes (Pl. XII, Fig. 10). Base of subgenital plate wide, short, consisting of a pair of plates which are bound on all sides by highly chitinized border except mesally. Egg-guide somewhat arrow-shaped, blunt pointed, the distal three-fifths weakly chitinized and the lateral margins parallel. Ventral gonapophyses normal. Lateral gonapophyses sleeve-like, rather weakly chitinized and slightly pilose on the swollen proximal half. Dorsal gonapophyses, with a drawn out sharp apex; a small brownish area along disto-mesal margin. Suranal plate blunt-pointed, triangular.

Male:

Length of fore wings 3.5 mm.

Marked as female. Eyes large. Genital processes (Pl. XIV, Fig. 19) asymmetrical, strongly chitinized, cap-like. Basal sclerite very large, fused broadly to the roughly triangular hypandrium. Distally on hypandrium the structures disposed as follows, proceeding from the outside in: outermost, arising on the right and twisting to the left a large hollow swollen piece which ends in a point; arising below but extending beyond (from some angles appearing as a continuation of the first structure) a circular piece; lying below the cap formed by these two structures, on the left, a strong, inward directed, sharp prong supported by chitinization from the left margin of hypandrium; then mesally a curious straight rod which is worked distally. On the right, supported by chitinization from the margin of hypandrium a small twisted, elongate, flat piece, the outer surface of which is thickly studded with stout tubercles. Parameres independent, consisting of a pair of rather straight rods which distally are swollen and forked. A small prong distally on the paraprocts. Suranal plate with a small triangular perpendicular part.

Pennsylvania: Philadelphia. (S. F. Aaron).

Described from two paratypes, one kindly supplied by the Philadelphia Academy of Natural Sciences and the other by the Museum of Comparative Zoology.

Florida: Appalachicola 2 ♂ (M. C. Z.). Holotype and Paratype of *P. medialis* Banks.

***Psocus venosus* Burmeister**

Psocus venosus Burmeister. Hanb. Ent. **2**: 778. 1839.

Psocus microphthalmus Rambur. Hist. Nat. Neuropt. p. 321. 1842.

Psocus magnus Walker. Cat. Neuropt. Brit. Mus. p. 484. 1852.

Psocus aceris (Fitch in litt.) Hagen Verh. zool.-bot. Ges. Wein. **16**: 211. 1866.

Psocus gregarious Harris. Ent. Corresp. p. 329. 1869.

Cerastis venosa Kolbe. Stett. Ent. Zeit. **44**: 69. 1883.

Cerastipsocus venosus Kolbe. Berlin, Ent. Zeit. **28**: 38. 1884.

Psocus gossypii Ashmead. Insect Life **7**: 29. 1894.

Female.

Length of fore wings 6.4 mm. ave. of 10 individuals.

Length of body 4.4 mm. ave. of 10 individuals.

Length of antennæ 8-10 mm. measurement of 10 individuals.

Wings uniformly brownish black; the abdomen dark brown ringed with white or yellow and the head and thorax dull orange. (In poorly preserved specimens and those which have been in alcohol several years the wings become a drab brown and body colors dull.) Head dull orange unmarked, except for indistinct brownish areas on vertex and faint lineation on clypeus. Maxillary palpus brown, the segments small. Eyes a phosphorescent blue-green. Antennæ dark brown except segments 1 and 2, which are pale.

Thorax nearly concolorous with head; tergal lobes brown medianly and the median lobe dark brown anteriorly while the posterior margin of the lateral lobes is abruptly cream colored in fresh specimens; pleuræ dusky. Femora pale; tibia dull orange, dark brown distally; tarsi dark brown. Fore wings (Pl. XX, Fig. 23) uniformly brownish black throughout changing to a golden brown with long preservation in alcohol. Pterostigma opaque, white, in some individuals variously covered in extent and intensity with grey; the cell is deep, angulate, isosceles triangular in shape. Veins in basal half of wing white, R dusky, those on apical half dark brown. Hind wing uniformly fumose.

Abdomen typically dark brown suffused with grey and with narrow stripes of cream or yellow at the sutures of the tergum; also coarsely dotted and streaked with whitish at the spiracles and elsewhere. Terminal segments and genital processes (Pl. XII, Fig. 4) from below pale, the structures are weak and "made out" with difficulty. The subgenital plate consists of a narrow basal stripe which gives rise medianly to the urn-shaped egg-guide with a superficial apical pocket. Ventral gonapophyses short, stiletto-like, extending below and shortly beyond the egg-guide. The proximal and lateral portion of the lateral gonapophyses strongly chitinized and pilose; the concave distal and inner portion non-chitinized, non-pilose. Dorsal gonapophyses weak, inconspicuous, apex abruptly pointed; chitinized support strong, produced into an inverted Y distally. Lateral and dorso-distal portion of paraprocts strongly chitinized; sense tubercles brown, large, much elevated. Suranal plate triangular, apex swollen, pilose, weakly chitinized.

Male:

Length of body 3.3 mm. ave. of 10 individuals.

Length of fore wings 4.7 mm. ave. of 10 individuals.

Length of antennæ 9 mm. from one specimen.

Closely resembles female in general appearance: wings possibly slightly darker, the pterostigma usually clouded partly or entirely with grey and brown; eyes of moderate size, larger; antennæ proportionately stouter, more densely pilose.

Genital structures small, symmetrical; hypandrium (Pl. XIII, Fig. 9), a narrow jaw-like piece which bears distally a membranous or weakly chitinized pouch-like portion supported medianly by a short, flat ridge and laterally by a pair of shorter finely drawn out twisted strips. The median ridge widens and is slightly notched or truncate distally. The parameres united, forming an elliptical structure and consisting of a pair of thin rods fused proximally and closely appressed distally; the distal portion normally extending slightly beyond the end of the median ridge on hypandrium. Sense tubercles on paraprocts brown, large: the distal portion large, plate-like, produced distally into a blunt point below which arises a sharp upward di-

rected claw. Suranal plate triangular with the apex and a small triangle at the base weakly chitinized.

New York: Ithaca, Aug. 9, 1890, many ♀ and ♂ (A. P. Morse), Aug. 17, 1897, 3 ♀, Aug. 23, 1897, 5 ♂ 4 ♀, July 25, 1896, many ♀ and ♂, Aug. 4, 1898, 2 ♀, Aug. 8, 1892, 2 ♀ 6 ♂, Aug. 9, 1890, ♀ and ♂: Westport, Aug. 11, 1906, 3 ♀, N. Y. S. M.: Middleburg, Aug. 10, 1881, 1 ♀, N. Y. S. M.: Coy Glen, Tompkins Co., July 30, 1921, 2 ♀; Alpine, Aug. 20, 1897, 4 ♀.

Rhode Island: 6 ♀ 2 ♂.

Maryland: Somerset, July 24, 1926, 5 nymphs (E. N. Cory).

Illinois: Urbana, Aug. 7, 1885, 1 ♀, I. N. H. S.; Normal, 4 ♀, I. N. H. S.

Georgia: Spring Creek, Seminole Co., 3 ♀ 4 ♂ (C. R. C.); Billy's Island, Okefinokee Swamp, July, 1912, 3 ♀ 2 ♂; St. Simons Island, April 22-May 12, 1911, 3 ♀ 3 ♂ (J. C. Bradley).

Florida: Gainesville, 104 ♀ 145 ♂ (T. H. Hubbell); Orlando, Aug. 2, 1926, 8 ♀ 2 ♀ 37 nymphs (O. C. McBride), June, 1927, 3 ♀ 2 ♂ (O. C. McBride); St. Cloud, Jan. 20, 1927, 44 ♀ 12 ♂ (M. D. Leonard) on trunk of orange tree feeding on lichens or the fungus growing on old scale insects. All the individuals in a colony; Wewahitchka, Dead Lake, April 6, 1927, 14 nymphs (C. R. C.); Key West, 2 ♂ (Morrison) supplied by M. C. Z.

Louisiana: Baton Rouge, April 21, 1922, 13 ♀ 3 ♂ on bark of wild cherry; May 3, 1927, 12 ♀ 6 ♂ 12 nymphs on bark of oak. (All by O. W. Rosewall.)

Subfamily Pseudopsocinae

Pseudopsocus new genus

Genotype: *Psocus amabilis* Walsh 1863.

Except for the wing venation, which is essentially that of *Psocus*, this genus resembles members of the family Caeciliidae, especially *Lachesilla*. Subcosta absent; R and R₁ parallel costa until the middle of pterostigma, where R₁ curves strongly into the wing and as suddenly turns to costa, causing the pterostigma to be deep and truncate distally. *Pseudopsocus* differs from *Psocus* as follows: veins in basal third of wings adorned with hairs; tibiae of metathoracic legs unarmed with ctenida; male genitalia differing in many particulars as indicated in the figure and description of *Pseudop. amabilis*; a readily discernible difference is the absence of a distal claw on the paraprocts. In the female the subgenital plate is simple, without an egg-guide, and the gonapophyses have been united into a single pair.

***Pseudopsocus amabilis* (Walsh)**

Psocus amabilis Walsh. Acad. Nat. Sci. Phila. Proc. **14**: 362, 1862.

Psocus minusculus Banks. Am. Ent. Soc. Trans. **32**: 3, 1905.

Female:

Length of body 2.5 mm. ave. of 7 individuals.

Length of fore wings 2.7 mm. ave. of 7 individuals.

Length of antennæ 1.9 mm. ave. of 7 individuals.

Dull orange throughout except that the abdomen, exclusive of the genital processes, is paler. Head unmarked, covered above with long dark hairs which are shorter on clypeus, genæ non-pilose. Maxillary palpus concolorous with head. Compound eyes small, dull black. Antennæ moderately stout, first two segments, while stout, not much thicker than the others; proximal half of each segment, exclusive of 1 and 2, pale, apical portion brownish; distal segments become uniformly light brown.

Thorax: Slightly deeper colored than head in some specimens. Dorsum covered with hairs, similar to those on head, darker. Legs slightly paler than thorax. Fore wings (Pl. XX, Fig. 1) slightly clouded with brownish. Pterostigma only slightly opaque. Brownish spot at base of pterostigma and also deeper colored at end of anal veins. Veins conspicuous, light brown. R and R₁ parallel with costa until about the middle of pterostigma where R₁ curves posteriorly rather deeply and then curves sharply back to costa so that the distal margin of pterostigma is truncate. M broadly joined to Rs. Hind wings subhyaline.

Abdomen generally lighter than remainder of body, marked with pale, irregular stripes of greyish orange, paling out below. Terminal segments and genital processes (Pl. XVIII, Fig. 10) concolorous with head and thorax. Subgenital plate an inverted V in shape, with a rather blunt, rounded apex. A fine white line medianly at apex separates each element of subgenital plate. Gonapophyses (Pl. XVIII, Fig. 9) reduced, consisting of a single concave piece, and distally drawn out into a sharp, upward pointing prong. Paraprocts with a strongly chitinized portion involving the apex and lateral surface; sense tubercles small,

brown; proximo-mesally a large area covered with short hairs while at the apex several conspicuous bristles. Suranal plate cap-like, short, triangular from above.

Male:

Length of body 1.9 mm. ave. of 7 individuals.

Length of fore wings 2.1 mm. ave. of 7 individuals.

Length of antennæ 1. mm. ave. of 7 individuals.

Colored as female, usually head and thorax darker and abdomen paler. Eyes small, only slightly larger than female. Genital processes (Pl. XVIII, Fig. 7) symmetrical, occupying only a small portion of abdomen; concolorous with head and thorax. The large O-shaped parameres arise from a small crescent-shaped plate—the basal plate, whence the extremely thin highly chitinized arms advance to hypandrium. Just below the base of hypandrium, hinged to, and when viewed from below appearing as a continuation of the lower clasper arms, advance a pair of thin strips which soon fuse medianly and give rise to a strong, inward curved hook. Below the hook lies what is probably a true penis which resembles the letter Y; this is part of a pocket-like formation of two plates, one margined by the strips bearing the clasper hook and the other by the continuation of the lower clasper strips. Hypandrium short, shield-like, the distal margin bearing a pair of inconspicuous short teeth. Sense areas on paraprocts, proximal, small; the distal portion broad, weakly chitinized. Suranal plate a thin crescent-shaped piece.

New York: Ithaca, Sept. 12, 1925, 7 ♀ in dry oak and poplar leaves; Sept. 6, 1926, 9 ♀, July 11, 1926, 2 ♀; Sea Cliff, L. I., Sept. 6, 1925, 6 ♀ 4 ♂ in dry oak leaves; Olcott, Sept. 19, 1925, 18 ♀ 3 ♂; Rock City, Sept. 16, 1925, 7 ♀ 3 ♂; Geneseo, Sept. 20, 1925, 1 ♀ 1 ♂; Barcelona, Sept. 18, 1925, 7 ♀; Stow, Sept. 17, 1925, 28 ♀ 6 ♂; Richburg, Sept. 16, 1925, 16 ♀ 4 ♂; Ceres, Sept. 16, 1925, 3 ♀; Clarksburg, Sept. 18, 1925, 2 ♀; Painted Post, Sept. 15, 1925, 9 ♀; Silver Creek, Sept. 18, 1925, 18 ♀ 5 ♂ in dead oak leaves; Elmira, Oct. 1, 1925, 18 ♀ 5 ♂ in oak leaves; Penn Yan, Aug. 29, 1926, 12 ♀ 5 ♂; Ballston Lake, July 14, 1926, 1 ♀; Hudson, July 15, 1926, 1 ♀; Nigger Pond, Oswego Co., Sept. 3, 1926, 1 ♀.

Illinois: Rock Island, 1864, 1 ♀ (B. D. Walsh) M. C. Z. Paratype.

Virginia: Blacksburg, Oct. 4, 1926, 1 ♀ 1 ♂ (C. & B.); Falls Church, Oct. 10, several specimens. Types of *P. minusculus* Banks. M. C. Z.

Tennessee: Mill Creek, below falls on Mt. Leconte, Oct. 10, 1926, 1 ♂ (C. & B.).

(To be continued)